THE MARINE REVIEW

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Latest Facts About U. S. Ships

Present Policy of Shipping Board With Regard to Ship Construction, Sales and Cancellations, Outlined at Congressional Hearings

WHILE public investigation of the war record of the shipping board has not been made by the new congress, senators and representatives have available now a considerable amount of fresh information on the work of the board. The following summarizes these main facts, additional details regarding cancellations being given on pages 369-371.

Entire shipbuilding program to be completed very early in 1921, almost all by June 30, 1920.

Cancellations involve 754 ships of 3,797,895 tons, leaving 2394 vessels of 13,595,236 tons. This total, of course, includes all vessels built to date.

Cancellations involve 21.8 per cent of total tons in original program and 24 per cent of the ships.

Thirty-one wooden ships costing $200 per ton have been sold for an average of $132 a ton.

Requisitioned Norwegian ships, after settlement with original owners, cost $256 a ton against $135 a ton, named in original contracts.

Fifty thousand more men employed in shipyards now than on Armistice Day.

Readjusted contracts were placed recently by shipping board in this country at $160 to $170 per deadweight ton.

Shipping board canceled all contracts where cost of completion was less than loss if the vessels were completed, fully equipped, and sold.

Eighty per cent of material for all ships delivered on June 1.

Of every 100 ships built now, only four give any mechanical trouble.

All wood cargo ships are now delivered or launched.

Costs of building wood or steel vessels are approximately the same.

Wooden ships for sale at $90 per ton cash.

Boiler installations withheld on 150 wooden ships.

The resignation of Mr. Hurley throws the merchant marine question, as far as the shipping board is concerned, high into the air. The retiring chairman, publicly and strenuously has advocated private ownership and operation of shipping and his policy of canceling war contracts and selling ships has backed up this view. John Barton Payne, nominated to succeed Mr. Hurley, is an eminent lawyer, but like most of the appointments to the shipping board, is unfamiliar with practical marine problems. The country is almost universally committed to the plan of getting the government out of industry as quickly as possible. Congress is said strongly to support this sound economic policy. The much-reorganized board will receive support to the degree with which it follows this tested policy.

Status of Ship Program, June 30, 1919

Total Tons in Program 17,393,061. Tons Canceled 3,797,805.

	Total in Program.	Delivered.	Launched and Fitting Out.	On Berths.	Canceled.	Not Started.
Contract steel	1676	460	198	391	325	302
Contract wood	1030	361	193	88	385	3
Contract concrete	42	...	7	7	28	...
Total contract	2748	821	398	486	738	305
Requisitioned	400	334	17	20	16	13
Grand total	3148	1155	415	506	754	318
ESTIMATED STATUS ON DECEMBER 31, 1919						
	3148	1832	209	222	754	131
ESTIMATED STATUS ON MARCH 31, 1920						
	3148	2016	163	127	754	88
ESTIMATED STATUS ON JUNE 30, 1920						
	3148	2179	80	100	754	35

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World Charter Market Reviewed by

OUTLOOK GOOD

American Bottoms Carry About 50 Per Cent of American Commerce and the Proportion is Increasing

ACCORDING to present prospects, one-half of America's foreign commerce will soon be carried in American bottoms. The latest tabulation of the government shows that in April 47 per cent of our commerce was carried in American ships. The proportionate increase in the American merchant marine has been progressing rapidly ever since. The bulk of these ships, however, are government owned and are being operated for shipping board account. The board announced last month that 221 ships of 1,172,704 deadweight tons, flying the American flag, are now plying out of New York, Boston, Philadelphia and Wilmington, N. C., on routes to the east and west coasts of South America, China, Japan, Australia, New Zealand, New Guinea, Africa, transatlantic ports, the Mediterranean and South Europe, West Indies, Levant, Straits Settlement and Dutch East Indies. From Hampton Roads, Va., Charleston, S. C., Savannah, Ga., Brunswick, Ga., Jacksonville, Fla., Pensacola, Fla., Mobile, Ala., Tampa, Fla., New Orleans, Gulfport, Miss., Galveston, Tex., Texas City, Tex., and Port Arthur, Tex., a total of 697,807 deadweight tons are plying.

The predominating position of the shipping board vesesls in the charter market is giving the government a powerful hand in the rate-making situation. Ocean rates have been on the downward trend during the past month and privately owned vessels are being compelled to observe the government rates almost as soon as published. The board has inaugurated a cargo liner service from New York to Constantinople and Black Sea ports with the steamship HAUCHUCA, 7300 deadweight tons.

Private Ships Returned

Private American lines have been receiving their ships back from requisition but slowly, despite the rapid reduction of war services. During the first 21 days of June, the war department returned to the shipping board over 199,000 deadweight tons of requisitioned ships, but the shipping board returned only nine ships to their owners during the month. The tonnage now in use by the war department has dropped to approximately 1,300,000 deadweight tons, as compared with 3,253,000 tons under requisition on Dec. 2 last. Of the present tonnage in service for the war department, 1,129,000 deadweight tons are being used to bring back troops, 28,000 tons are refrigerators, and about 150,000 tons are cargo carriers. The ships returned to their owners during June were the PARTHION to the Olympia Shipping Co., SANTA ROSALIA to the United Steel Products Co., LESSELL to D. H. E. Jones, FORDONIAN to American-Mediterranean Steamship Co., AMAZONIA to Perros P. Tatanis, MOLDEGAARD to Bull Insular Steamship Co., EL OCCIDENTE to Southern Pacific Co., COASTWISE to Coastwise Transportation Co., and the WINNEBAGO to Winnebago Steamship Corp.

The shipping board is lending all possible encouragement to American shipping men to purchase government-owned tonnage. Several steel steamers have been disposed of in this manner. Five were purchased by the National Shipping Corp., four by George W. Cole, agent for a new company, two by the French-American Line, and one by the Omego Steamship Co. The vessels sold included some constructed on the Great Lakes and others built by the government fabricating shipyard at Newark, N. J. Business men of Tampa, Fla., are reputed to be on the point of purchasing some of the government tonnage and inaugurating a steamship line to Central America.

A new steamship line between Philadelphia and South America has been inaugurated with the NEDMAC, a Hog Island vessel, by the International Freighting Corp. She loaded for Buenos Aires and La Plate ports. This new line proposes to have two sailings a month. The LAKE FLYNUS will initiate a new service between Boston and Buenos Aires. The shipping board promises to allocate other vessels shortly to this trade.

Shipping Activities Increase

The Polish Navigation Enterprises has been incorporated under the laws of Delaware. It has been announced that the company will do business between the United States, Poland and other countries. No further definite information has been given of the project. The Carolina Co. has expanded its charter in order to do a general shipping business. It will begin by operating steamers to Liverpool. The Pacat Steamship Corp. is loading steamers at Pensacola, Fla., for Buenos Aires. These vessels will take a triangular voyage, Rotterdam, Antwerp and other North sea ports being the other point of contact. It is expected that six vessels will be used. The Bull line, which expects to have its last requisitioned ship returned shortly will inaugurate a service to Constantinople. Owing to rail competition, the coastwise steamers are not believed to be doing well. New England services are increasing but the Clyde line has discontinued its service between

To Sell Surplus

THE United States shipping board has arranged for the sale of its surplus and salvage property, including supplies, material and equipment. Complete manufacturing plants, entire shipyards, drydocks, ships, complete or half built, and any article down to scrap metal are among the items to be disposed of by public sale. These sales will afford an unusual opportunity to the industries which stand in need of material, equipment and supplies of the kind employed by the Emergency Fleet corporation, but there will be no "unloading" upon either the general or local markets. To sell to the market, and not to break the market, is said to be the government policy.

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Experts in This Country and Abroad

TRADE TO GROW

Sudden Spurt Predicted with Peace Signed—Many New Services Are Being Established to Foreign Ports

Philadelphia and New York. The Norfolk service was suspended last February. The BERMUDIAN has been returned from war service and the Quebec Steamship Co. is operating her in her old service.

The cessation of war requirements and the sudden return of ships to peace lines is rapidly restoring normality in shipping. Space is much easier and rates are declining slightly. The port of New York has been congested with vessels waiting for a berth, and the same situation is said to exist at the English ports. Steamship operators are now advertising for cargoes and warehouse space in American ports is to let. General commodities have been exported to Europe on British boats at $1.40 to $1.50 per 100 pounds, but some of the private operators have been accepting cargo at Boston for $1 per 100 pounds. The port of Philadelphia has been busier than ever before. The arrival of the new ships built on the Great Lakes has contributed much to this situation. Many of these have been chartered for grain shipments, and they are moving commodities to both Europe and South America from the North Atlantic ports. A standard vessel of the FRANCONIA type has been adopted by the Cunard line. This kind of vessel will be put in the Liverpool-New York service in the immediate future.

Vessels Are Plentiful

With the larger supply of government tonnage at the command of exporters, it is not likely that the market will hear much more about a lack of vessels to move American commodities, unless something unforeseen happens. Naturally ,a sudden spurt in foreign trade is expected with the signing of the peace treaty, but even this is not expected to cause any such scarcity of space as has been experienced in the past. The expansion of ocean commerce from the Atlantic ports has been termed abnormal and signs of further growth are seen on all sides. The new tonnage being built will undoubtedly be rapidly assimilated, it is thought. Agents for the large steamship lines report a good business. The fast passenger ships have been taking freight at $41 to Bordeaux and Havre, with from $25 to $30 prevailing on slower vessels. Liverpool and London have been done on the basis of $18 to $20, while Marseilles has been quoted at $30, Capetown at $22.50 and South American ports at $25. The opinion as to the future of rates is not unanimous. Exporters will say that as the new tonnage increases the freight rates will decline but many shipping experts insist that a healthy and rapid increase in foreign trade and a greater demand for ship space will develop.

Chairman Hurley recently said that vessels today are receiving a charter hire of $3 per ton. This figure is much below what the charter was the first of the year. The chartering business is so limited that it is difficult to estimate the market. On the net form there has been little business, although it was reported that a boat was taken for Copenhagen at $40 and that $30 was given to Spain. Numerous orders were in circulation, including Gulf to Liverpool, $27.50, June-July, French Atlantic $40, and West Italy $45 to $47.50. The nitrate ports have been quiet owing to the tonnage scarcity, and full rates have been offered for shipments to both the United Kingdom and the continent.

The ports of Rotterdam and Antwerp have been extremely active and they are now said to be fast approaching their prewar normal. Further increase in these services depends largely upon the rapidity with which the canal connections inland are restored. London docks are said to be as full as they have ever been in the history of the port. An actual glut of ships exists, owing to the number of vessels released from government work, and vessels have been arriving quicker than they could be dealt with. Injurious port congestion followed the general strike of harbor workmen at Liverpool.

Foreign Plans Develop

British shipping interests have not been overly pleased at the failure of the proposal to sell the English vessels of the International Mercantile Marine to a British syndicate. The failure of this deal, it was stated in London reports, will not affect the merger plans which are said to embrace the Peninsular & Orient line, Royal Mail, Cunard and Furness-Whitney.

A union between the Cunard Steamship Co. and the Robert Redford Co. of Canada has been completed. The Cunard line today includes lines of steamers trading on every ocean in the world, the combined services being known as the Cunard Allied Lines. The line expects to increase greatly its Canadian trade not only to London and Bristol and other English ports, but to Antwerp and Rotterdam and, which the opportunity offers, to Mediterranean and Black Sea ports. The Cunard line has announced a new monthly steamship service from Baltimore to Bristol. The Cunard line has also announced the

Asks Extension

APPEALS have been addressed to the shipping board by American operators seeking to have the life of the "red ink" licenses, issued during the war to alien deck and engineer officers, extended after the proclamation of the end of the war. Unless some action of this kind is taken, it is pointed out, that the United States shipping laws, which automatically are returned to force, will make it impossible for officers, who are not citizens, to serve on ships flying the American flag. At the present time there is a shortage of deck and engineer officers and, if the law becomes effective, the operators will be deprived of the services of a substantial number of men.

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starting of new freight service from New York to Levant and Black Sea ports.

The National Steam Navigation Co. of Greece is planning to book a passenger steamer from New York to Piraeus. The line will build some new cargo boats and has purchased a number of Russian vessels. There are 18 steamers in the company's fleet at present and it is planned to increase to double that number.

A Peruvian steamship line has been projected to operate between Callao and Barcelona, Spain. This would be operated by the Peruvian Steamship Co., which is partly government owned. All restrictions placed upon the navigation of Spanish vessels during the war have been raised.. The shipping interests there are considering the question of standardization of freight rates and the unification of services in order to make a more aggressive campaign for new markets.

Japanese Market Improves

While charter conditions at north Pacific ports continue unsettled, there has been a marked improvement in the Japanese market within the last month. Much more cargo is offering for the Far East, resulting in a firming of rates consequent with a falling off in the number of vessels on the route. It is reported that one large operator to Japan and China has raised rates to $15, August booking, indicating that the situation is stronger. The firmness is much more marked with respect to Japanese ports than to Chinese. The general outlook appears to uphold the contention of many operators that the Oriental charter market has touched the bottom and that the future will show continued firmness with rates tending to rise. Prevailing rates are still $12 weight and $15 measurement as established by the shipping board months ago.

Owing to better inducements in other trades, particularly in the Atlantic, many Japanese tramps which operated to Puget sound during the past year, have been withdrawn from the Pacific. While the vessels on this route have thus far been able to handle the cargo offering, any sudden increase in the movement will find space extremely scarce.

Coastwise Trade is Active

The coastwise lumber movement is active, California being an extremely heavy buyer. In consequence, the coasting vessels are fully occupied at remunerative rates, which have advanced 50 cents per thousand during the last month, being now $7.50 to San Francisco and $8.50 to southern California ports. This cargo is being handled by both steam schooners and barges in tow. There is a continued demand for tonnage to carry lumber and ties to Great Britain and the United Kingdom. The United States shipping board has assigned 26 wooden steamers to various north Pacific firms to carry ties to England and continental ports. The shipping board rate remains at $45, although as high as $53.50 has been paid for private vessels for this same trade. Notwithstanding, the government vessels now available for this movement, there is an acute scarcity of tonnage for the United Kingdom and Europe since an immense quantity of lumber, ties and construction material is awaiting space.

There is also a demand for space for barley and grain, the going rate on barley from San Francisco being $37 to Great Britain and $40 to Scandinavian countries. As far as can be learned, no fixtures have been made for the fall movement of grain from Oregon and Washington ports.

Little activity prevails in the trade routes to Australia and South America. Both these foreign markets, heavy purchasers of north Pacific lumber, are holding off in the hope of lower prices and reduced freights.

The British government has purchased large quantities of ties and lumber in British Columbia but this material has not begun to move as vessels have not been obtainable. As soon as the steamers being built at British Columbia yards for the French government are completed, they will be loaded with cargo for the British government, which is reported to have agreed to pay on basis of from $45 to $47 per thousand. Twenty of these vessels are building and they will all take cargo at British Columbia ports.

Japanese Ships are Boycotted

Due to dissatisfaction over the peace treaty, the Chinese boycott against Japan is spreading, according to a report from the American chamber of commerce representative at Shanghai. American goods arriving in China in Japanese bottoms will not be accepted by the consignees. The boycott eliminates all of the Japanese steamers in the China service out of Pacific coast ports as well as those clearing from New York and New Orleans. However, the Chinese are accepting goods arriving in ships of the China Mail Steamship Co. and the Pacific Mail Steamship Co. Dutch lines operating between San Francisco and the Dutch East Indies, it is rumored, may extend their present service to meet the emergency. In addition, the shipping board is considering the advisability of establishing direct service to Chinese ports.

Northern Pacific ports where goods are cleared for China almost exclusively in Japanese bottoms are particularly hard hit by the Chinese boycott. The lines wholly or partly affected are the Toyo Kisen Kaisha, Nippon Yusen Kaisha, Osaka Shosen Kaisha, two lines operated out of Seattle and two Japanese steamer companies operating out of New York.

Boston's Exports Increase

The port of Boston is congested with export business, as many as 17 huge ships having been taking cargo for Europe in one day during the past month. Thousands of tons of cereal and foodstuffs have been taken to sea in a procession of freighters that extended down channel as far as the eye could discern. Railroads are working hand in hand with the steamship companies.

Export of cereal from Boston in June increased approximately 500,000 bushels, England, Italy, France, Belgium and Germany getting the lion's share. Two big freighters with full cargoes of grain left port last month, one for Gibraltar and the other for Nantes. Two more ships stowed to the hatches with foodstuffs have been sent to Hamburg while Glasgow and Hamburg have taken 127,000 sacks of flour weighing 140 pounds per sack. Cereal exports for June were as follows: Wheat, 1,427,991 bushels; oats, 391,372 bushels; barley, 389,630 bushels. On this grain the rates are under government control. British ships are receiving from $1 to $1.50 per 100 pounds and in such ships the government reserves 50 per cent space while the remainder is for commercial freight. Heavy trade is predicted for some months.

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Steel Ships Suspended or Cancelled, April 30, 1919

Company and location	Number of ships	Deadweight ton per ship	Total deadweight tons	Type	Cost—Contract	Cost—Total estimate with extras total	Cancellation cost at $50 per deadweight, ton	Saving effected
NORTH ATLANTIC—								
Suspensions:								
Groton Iron Works, Groton, Conn.	3	9,400	28,200	Cargo	$1,710,800	$6,066,102	$1,410,000	$4,656,102
District total	3	.....	28,200	.....	.....	6,066,102	1,410,000	4,656,102
DELAWARE RIVER AGENCY—								
Suspensions:								
American Inter. Shipbuilding Corp., Hog Island, Pa.	23	8,000	184,000	Trans.	1,732,500	43,840,300	9,200,000	34,640,300
Cancellations:								
American Inter. Shipbuilding Corp., Hog Island, Pa.	35	8,000	280,000	Trans.	1,732,500	66,713,560	14,000,000	52,713,500
Merchant Shipbuilding Corp., Bristol, Pa.	20	9,000	180,000	Cargo	1,714,447	35,606,440	9,000,000	26,606,440
Suspension total	23	.....	184,000	.....	.....	$43,840,300	$9,200,000	$34,640,300
Cancellation total	55	.....	460,000	.....	.....	102,319,940	23,000,000	79,319,940
District total	78	.....	644,000	.....	.....	$146,160,240	$32,200,000	$113,960,240
DELAWARE RIVER—								
Cancellations:								
Chester Shipbuilding Co., Chester, Pa.	7	8,725	61,075	Cargo	1,635,937	11,451,562	3,053,750	8,397,812
District total	7	.....	61,075	.....	1,635,937	11,451,562	3,053,750	8,397,812
MIDDLE ATLANTIC—								
Suspensions:								
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.	6	10,300	61,800	Tank	2,300,000	15,220,860	3,000,000	12,130,860
Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.	2	6,000	12,000	Tank	1,400,000	3,102,400	600,000	2,502,400
Bethlehem Shipbuilding Corp., Ltd., Sparrows Pt., Md.	3	7,400	22,200	Cargo	1,375,000	4,125,000	1,110,000	3,015,000
Virginia Shipbuilding Corp.	2	9,400	18,800	Cargo	1,504,000	3,572,000	940,000	2,632,000
District total	13	.....	114,800	.....	.....	$26,020,260	$5,740,000	$20,280,260
SOUTHERN—								
Suspension:								
Merrill-Stevens Shipbuilding Corp., Jacksonville, Fla.	6	9,000	54,000	Cargo	1,463,440	$10,400,400	$2,700,000	$7,700,400
Merrill-Stevens Shipbuilding Corp., Jacksonville, Fla.	5	4,300	21,500	Cargo	825,000	4,301,250	1,075,000	3,226,250
Terry Shipbuilding Corp., Savannah, Ga.	5	7,500	37,500	Tank	1,635,300	9,021,750	1,875,000	7,146,750
Mobile Shipbuilding Co., Mobile, Ala.	12	5,000	60,000	Cargo	980,000	12,246,000	3,000,000	9,246,000
Pensacola Shipbuilding Co., Pensacola, Fla.	6	9,000	54,000	Cargo	1,685,000	10,506,000	2,700,000	7,806,000
Cancellations:								
Merrill-Stevens Shipbuilding Corp., Slidell, La.	6	3,300	19,000	Cargo	520,000	3,120,000	990,000	2,130,000
Dierks Blodgett Shipbuilding Corp., Pascagoula, Miss.	10	9,000	90,000	Cargo	1,627,004	16,270,040	4,500,000	11,770,040
Suspension total	34	.....	227,000	.....	.....	$46,475,400	$11,350,000	$35,125,400
Cancellation total	16	.....	109,800	.....	.....	19,390,040	5,490,000	13,900,040
District total	50	.....	336,800	.....	.....	$65,865,440	$16,840,000	$49,025,440
SOUTHERN PACIFIC—								
Suspensions:								
Bethlehem Shipbldg. Corp., Ltd., Alameda, Cal. (Union)	3	10,100	30,300	Tank	2,310,000	7,226,852	1,515,000	5,711,852
Bethlehem Shipbldg. Corp., Ltd., Alameda, Cal. (Union)	3	11,800	35,400	Cargo	2,282,333	7,192,800	1,770,000	5,422,800
Hanlon Dry Dock & Shipbuilding Co., Oakland, Cal.	3	5,350	16,050	Cargo	1,043,250	3,251,100	802,500	2,448,600
Long Beach Shipbuilding Co., Long Beach, Cal.	4	8,800	35,200	Cargo	1,690,000	7,025,400	1,760,000	5,265,400
Los Angeles Dry Dock & Shipbuilding Co., Los Angeles	10	8,800	88,000	Cargo	1,716,000	17,806,000	4,400,000	13,406,000
Moore Shipbuilding Co., Oakland, Cal.	4	9,400	37,600	Cargo	1,844,800	7,654,400	1,880,000	5,774,400
Moore Shipbuilding Co., Oakland, Cal.	3	10,000	30,000	Tank	2,475,000	7,456,000	1,500,000	5,956,000
Southwestern Shipbuilding Co. San Pedro, Cal.	5	8,800	44,000	Cargo	1,720,369	8,913,305	2,200,000	6,713,305
Western Pipe & Steel Co., San Francisco, Cal.	4	8,800	35,200	Cargo	1,689,600	7,016,800	1,760,000	5,256,800
Cancellations:								
Bethlehem Shipbldg. Corp., Ltd., Alameda, Cal. (Union)	10	13,000	130,000	Trans.	4,764,000	95,280,000	13,000,000	82,280,000
Bethlehem Shipbldg. Corp., Ltd., Alameda, Cal. (Union)	10	13,000	130,000	Trans.				
Suspension total	39	.....	351,750	.....	.....	$73,542,657	$17,587,500	$55,955,157
Cancellation total	20	.....	260,000	.....	.....	95,280,000	13,000,000	82,280,000
District total	59	.....	611,750	.....	.....	$168,822,657	$30,587,500	$138,235,157
NORTHERN PACIFIC—								
Suspensions:								
Ames Shipbuilding & Dry Dock Co., Seattle, Wash.	2	8,800	17,600	Cargo	1,716,000	3,558,686	880,000	2,678,686
Columbia Shipbuilding Corp., Portland, Oreg.	2	8,800	17,600	Cargo	1,712,910	3,650,762	880,000	2,770,762
Duthie & Co., J. F., Seattle, Wash.	3	8,800	26,400	Cargo	1,672,000	5,217,720	1,320,000	3,897,720
Northwest Steel Co., Portland, Oreg.	6	8,800	52,800	Cargo	1,729,200	10,762,800	2,640,000	8,122,800
Standifer Construction Corp. G. M., Vancouver, Wash.	5	9,500	47,500	Cargo	1,820,000	9,447,500	2,375,000	7,072,500
Todd Dry Dock & Construction Co., Tacoma, Wash.	12	7,500	90,000	Cargo	1,265,500	16,088,500	4,500,000	11,588,500
Cancellations:								
Albina Engine & Machine Works, Inc., Portland, Oreg.	2	3,700	7,400	Cargo	765,000	1,587,800	370,000	1,217,800
Skinner & Eddy Corporation, Seattle, Wash.	17	9,600	163,200	Cargo	1,845,000	33,432,523	8,160,000	25,272,523
Skinner & Eddy Corporation, Seattle, Wash.	8	9,600	76,000	Cargo	1,845,000	15,328,800	3,840,000	11,488,800
Suspension total	30	.....	251,900	.....	.....	48,725,968	12,595,000	36,130,968
Cancellation total	27	.....	247,400	.....	.....	50,349,123	12,370,000	37,979,123
District total	57	.....	499,300	.....	.....	$99,075,091	$24,965,000	$74,110,091
GREAT LAKES—								
Suspensions:								
Globe Shipbuilding Co., Superior, Wis.	1	4,050	4,050	Cargo	800,000	864,715	202,500	662,215
McDougall-Duluth Co., Duluth, Minn.	1	4,050	4,050	Cargo	825,000	900,112	202,500	697,612
Manitowoc Shipbuilding Co., Manitowoc, Wis.	2	4,050	8,100	Cargo	822,000	1,739,150	405,000	1,334,150
Saginaw Shipbuilding Co., Saginaw, Mich.	6	4,050	24,500	Cargo	815,000	5,232,012	1,215,000	4,017,012
Toledo Shipbuilding Co., Toledo, O.	1	4,050	4,050	Cargo	825,000	847,845	202,500	645,345
District total	11	.....	44,550	.....	.....	$9,583,834	$2,227,500	$7,356,334
Grand suspension total	153	.....	1,202,200	.....	.....	$254,254,521	$50,110,000	$221,876,915
Grand cancellation total	125	.....	1,138,275	.....	.....	278,790,665	55,913,750	194,144,521
Contract steel total	278	.....	2,340,475	.....	.....	$533,045,186	$117,123,750	$416,021,436

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Steel Ships Suspended or Cancelled, April 30, 1919

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REQUISITION STEEL, DELAWARE RIVER—								
Suspensions:								
Pusey & Jones Co., Gloucester, N. J.	5	5,000	25,000	Cargo	975,000	4,875,000	1,250,000	3,625,000
Pusey & Jones Co., Gloucester, N. J.	4	5,000	20,000	Cargo	875,000	3,500,000	1,000,000	2,500,000
Pusey & Jones Co. (Pa. plant, Gloucester, N. J.)	2	7,500	15,000	Cargo	937,500	2,330,000	750,000	1,580,000
Pusey & Jones Co. (Pa. plant, Gloucester, N. J.)	5	12,500	62,500	Cargo	1,598,375	12,463,750	3,125,000	9,338,750
Requisition steel total	16	.....	122,500	.....	.....	$23,168,750	$6,125,000	$17,043,750
Steel total	294	.....	2,462,975	.....	.....	$556,213,936	$123,148,750	$433,065,186
Suspensions	169	.....	1,324,700	.....	.....	277,423,271	66,235,000	238,920,665
Cancellations	125	.....	1,138,275	.....	.....	278,790,665	56,913,750	194,144,521

Resume of Suspensions and Cancellations, April 30, 1919

	No. of ships	Total deadweight tons	Contract cost	Extras	Estimated cost	Cancellation cost Actual	Cancellation cost Estimated	Per cent	Saving effected
Steel complete:									
Suspensions	169	1,324,700	$256,422,630	$21,000,641	$277,423,271	.....	*$66,235,000	23.8	$238,920,665
Cancellations	125	1,138,275	268,703,042	10,087,623	278,790,665	.....	*56,913,750	20.4	194,144,521
Total	294	2,462,975	$525,125,672	$31,088,264	$556,213,936	.....	*$123,148,750	22.1	$433,065,186
Steel ocean tugs:									
Suspensions	24	†	7,489,000	635,340	8,124,340	.....	1,218,651	15.0	6,905,689
Cancellations	23	†	6,750,000	537,500	7,287,500	$747,301	.....	10.2	6,540,199
Total	47	†	$14,239,000	$1,172,840	$15,411,840	$747,301	$1,218,651	12.8	$13,445,888
Wood hulls:									
Cancellations	163	579,500	57,562,155	61,567,845	119,130,000	.....	48,900,000	41.0	70,230,000
Wood complete:									
Suspensions	6	30,000	4,620,000	.....	4,620,000	.....	1,800,000	38.9	2,820 000
Cancellations	42	187,200	30,055,443	1,786,557	31,842,000	.....	12,600,000	39.5	19,242,000
Total	48	217,200	$34,675,443	$1,786,557	$36,462,000	.....	$14,400,000	39.5	$22,062,000
Wood barges:									
Cancellations	114	307,150	23,220,000	.....	23,220,000	$1,326,262	1,567,800	12.5	20,325,938
Wood ocean tugs:									
Suspensions	1	†	232,000	6,100	238,100	.....	35,715	15.0	202,385
Cancellations	22	†	5,149,000	134,200	5,283,200	69,000	684,885	14.2	4,529,315
Total	23	†	$5,381,000	$140,300	$5,521,300	$69,000	$720,600	14.3	$4,731,700
Wood harbor tugs:									
Suspensions	19	†	2,779,600	.....	2,779,600	.....	416,940	15.0	2,362,660
Cancellations	12	†	1,695,600	.....	1,695,600	138,152	.....	8.1	1,557,448
Total	31	†	$4,475,200	.....	$4,475,200	$138,152	$416,940	12.4	$3,920,108
Composite:									
Suspensions	4	14,000	1,904,000	31,196,000	3,100,000	.....	1,200,000	38.7	1,900,000
Cancellations	2	7,000	952,000	598,000	1,550,000	.....	600,000	38.7	950,000
Total	6	21,000	$2,856,000	$1,794,000	$4,650,000	.....	$1,800,000	38.7	$2,850,000
Concrete:									
Cancellations	28	210,000	10,920,000	21,560,000	32,480,000	.....	8,400,000	20.1	24,080,000
Total suspensions	223	1,368,700	273,447,230	22,838,081	296,285,311	.....	70,906,306	23.9	253,111,399
Total cancellations	531	2,429,125	405,007,240	96,271,725	501,278,965	2,280,715	129,666,435	26.3	341,599,421
Grand total	754	3,797,825	$678,454,470	$119,109,806	$797,564,276	$2,280,715	$200,572,741	25.4	$594,710,820

*Cost of cancellation figured at $50 per deadweight ton.
†Tug, no tonnage given.

Employes at Work in Wood and Composite Shipyards

ENTIRE COUNTRY, 1918

Summary by months	Total employes on pay roll	Office employes and others on pay roll	Plant construction employes on pay roll	—Shipbuilders on pay roll— On E. F. C. work	On repair work	On other work	Total shipbuilders	Average attendance of shipbuilders On E. F. C. work	On repair work	On other work	Total shipbuilders	Per cent of attendance	Labor turnover per cent for month	Shipbuilders on E. F. C. pay roll by shifts First shift	Second shift	Third shift	Sunday attendance, all employes
January	31,547	3015	3451	23,666	397	1018	25,081	20,249	313	939	21,501	85.7	17.6	22,316	1,283	67	2,895
February	37,764	3275	3183	29,653	467	1186	31,306	25,277	388	1037	26,702	85.3	13.6	27,713	1,884	56	4,337
March	47,364	3310	3051	38,991	885	1127	41,003	32,899	764	943	34,606	84.4	14.6	35,600	3,196	195	4,605
April	58,312	3308	3318	49,262	1375	1049	51,686	42,842	1148	932	44,922	86.9	15.2	43,760	5,227	275	5,774
May	70,319	4022	3368	60,064	1490	1375	62,929	52,467	1200	1204	54,871	87.2	19.5	51,369	8,182	513	7,829
June	76,918	3893	3217	67,403	1259	1146	69,808	58,995	988	962	60,945	87.3	16.1	56,221	10,125	1057	10,785
July	81,333	4242	3118	71,722	1320	931	73,973	62,931	1137	796	64,864	87.7	21.3	00,613	10,122	967	6,847
August	85,065	4676	3483	75,133	905	868	76,906	65,471	702	727	66,900	87.0	16.0	64,173	10,121	839	6,255
September	90,627	5061	3843	80,102	888	733	81,723	68,788	684	601	70,073	85.7	16.7	69,024	10,083	995	6,037
October	90,887	4685	4352	80,007	1193	650	81,850	65,608	913	513	67,034	81.9	18.6	68,726	10,597	774	6,108
November	86,469	4898	3243	76,762	623	943	78,328	63,498	482	738	64,718	82.6	13.3	70,803	4,593	1366	4,778
December	74,214	4277	2355	66,224	591	767	67,582	54,774	469	579	55,823	82.6	11.6	62,636	1,995	1593	2,240
ENTIRE COUNTRY, 1919																	
January	64,098	4246	2263	56,565	552	472	57,589	46,225	435	393	47,053	81.7	16.4	53,043	1,785	1737	1,586
February	55,733	3854	1895	49,192	86	706	49,984	41,756	71	599	42,426	84.9	9.1	47,090	413	1689	1,106
March	43,109	3391	1308	37,793	163	454	38,410	33,147	138	401	33,686	87.7	8.1	36,405	459	929	924
April	29,821	2480	630	25,730	186	795	26,711	23,028	158	576	23,762	89.0	8.5	25,530	169	31	649

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Employment Work in Steel Shipyards

ENTIRE COUNTRY, 1918

Summary, by mths.	Total employes on pay roll	Office employes and others on pay roll	Plant construction employes on pay roll	Shipbuilders on pay roll—On E. F. C. work	On navy work	On repair work	On other work	Total shipbuilders	Average attendance of shipbuilders—On E. F. C. work	On navy work	On repair work	On other work	Total shipbuilders	Per cent of attendance	Labor turnover, per cent for mth.	Shipbuilders on E. F. C. pay roll, by shifts—First shift	Second shift	Third shift	Sunday attendance, all employes
Jan.	182,545	15,931	47,066	85,581	22,531	7298	4138	119,548	71,039	17,626	6028	3253	97,946	81.9	18.4	77,277	7,132	1172	33,477
Feb.	193,682	16,252	45,230	93,564	27,262	6964	4410	132,200	77,908	21,021	5723	3518	108,170	81.8	15.9	81,419	10,553	1592	30,174
Mar.	212,971	16,199	44,951	108,329	32,366	6998	4128	151,821	91,632	26,360	5850	3278	127,120	83.7	15.7	95,242	11,199	1888	38,219
Apr.	236,683	17,761	47,657	122,934	36,568	7469	4294	171,265	103,292	30,594	6300	3686	143,872	84.1	15.1	108,099	12,558	2277	28,870
May	260,690	19,468	45,002	142,554	40,858	7092	5716	196,220	122,322	35,410	6275	4806	168,813	86	19.5	124,510	14,945	3099	38,498
June	280,958	21,944	40,023	161,967	43,436	6919	6678	218,991	140,404	38,566	6028	5629	190,627	87	16.5	141,099	16,883	3985	48,611
July	298,546	23,964	35,294	176,821	47,178	7227	8062	239,288	152,274	41,303	6206	7002	206,785	86.4	20.5	157,043	16,382	3396	45,120
Aug.	316,393	25,334	31,273	196,162	49,651	6480	7493	259,786	166,161	43,619	5498	6376	221,654	85.3	21.1	173,662	18,671	3829	82,363
Sept.	332,090	27,637	27,294	212,173	51,788	7167	6031	277,159	180,014	44,648	6143	5260	236,064	85.2	21.1	182,904	25,131	4138	53,382
Oct.	334,296	27,102	24,450	218,259	51,596	7596	5487	282,738	177,197	41,773	5688	4470	229,128	81	24.6	190,169	23,921	4169	50,007
Nov.	347,872	29,523	23,055	233,797	49,124	6389	5984	295,294	189,691	40,117	5126	4994	239,928	81.3	19.8	208,531	21,809	3457	38,304
Dec.	351,584	29,160	21,590	239,620	48,163	7304	5742	300,834	196,525	39,977	5879	4785	247,166	82.2	21.6	214,671	21,457	3492	21,272
ENTIRE COUNTRY, 1919																			
Jan.	352,957	26,569	22,666	243,062	47,749	7363	5548	303,722	200,450	41,867	6218	4598	253,133	83.3	21.4	219,484	20,210	3368	19,243
Feb.	340,165	26,992	17,222	236,146	48,969	5414	5422	295,951	198,433	42,412	4561	4528	249,934	84.5	16.0	214,238	18,493	3415	10,717
Mar.	358,280	26,659	15,109	255,760	46,390	6416	7946	316,512	222,745	40,188	5556	6802	275,291	87.0	16.5	231,117	20,809	3834	8,028
Apr.	362,189	26,651	10,733	265,390	47,820	7211	4384	324,805	232,830	41,054	6409	3891	284,184	87.5	16.4	233,526	27,028	4836	6,845

Steel Shipyard Employes Before and After Armstice

NOVEMBER, 1918

District	Total employes on pay roll	Office employes and others on pay roll	Plant construction employes on pay roll	Shipbuilders on pay roll—On E. F. C. work	On navy work	On repair work	On other work	Total shipbuilders	Average attendance of shipbuilders—On E. F. C. work	On navy work	On repair work	On other work	Total shipbuilders	Per cent of attendance	Labor turnover, per cent for mth.	Shipbuilders on E. F. C. pay roll, by shifts—First shift	Second shift	Third shift	Sunday attendance, all employes
N. Atlantic....	67,429	4,798	3,620	43,702	13,683	590	1036	59,011	37,482	11,338	476	807	50,103	87.9	14.6	41,414	2,260	28	5,573
Delaware river..	100,370	13,151	11,816	60,789	12,995	612	1007	75,403	49,033	11,033	527	841	61,434	81.4	14.4	56,739	3,552	498	14,467
Middle Atlantic.	30,188	1,593	2,527	17,108	5,249	3569	142	26,068	13,909	4,524	3003	108	21,544	82.6	16.3	15,757	1,351	...	3,455
Southern district	7,977	355	482	6,228	724	16	172	7,140	5,072	554	12	135	5,773	80.8	22.8	5,704	460	64	1,936
So. Pacific.....	57,662	4,238	2,509	33,444	16,473	889	109	50,915	28,304	12,668	707	89	41,768	71.2	20.2	28,391	3,874	1179	1,929
No. Pacific	49,859	3,102	1,017	42,748	.....	52	2940	45,740	36,850	.....	49	2618	39,517	86.4	23.5	32,787	8,308	1653	2,869
Gt. Lakes	34,387	2,286	1,084	29,778	.....	661	578	31,017	24,292	.....	534	458	25,284	81.5	12.7	27,739	2,004	35	8,075
Grand total..	347,872	29,523	23,055	233,797	49,124	6389	5984	295,294	194,942	40,117	5308	5056	245,423	83.1	19.8	208,531	21,809	3457	38,304
APRIL, 1919																			
No. Atlantic...	64,774	4,821	440	44,955	12,697	293	1568	59,513	39,567	10,952	264	1346	52,129	87.6	15.9	38,778	[illegible]92	1095	457
Delaware river..	51,710	6,385	638	28,771	14,064	996	856	44,687	25,296	12,207	905	776	39,186	87.7	10.5	25,521	2,8[illegible]	439	1,042
Delaware riv. ag.	40,697	4,550	4,145	32,002	.....	...	....	32,002	28,907	.....	...	...	28,907	90.3	14.4	31,499	503	...	1,216
Middle Atlantic	35,710	1,707	2,113	21,731	7,101	2857	201	31,890	18,248	6,251	2479	165	27,144	85.1	15.1	19,148	2,132	451	884
Southern	14,591	1,194	209	10,388	838	862	1100	13,188	9,094	805	816	1024	11,739	89.0	16.2	10,283	99	6	75
So. Pacific	58,842	3,564	1,604	39,187	12,761	1312	394	53,654	34,139	10,502	1152	354	46,147	86.0	18.5	35,096	3,258	838	832
No. Pacific	54,746	2,170	827	51,299	359	91	....	51,749	45,576	337	79	...	45,902	86.9	28.0	41,500	8,164	1635	1,817
Great Lakes ...	41,119	2,240	757	37,057	.....	800	265	38,122	32,000	.....	714	226	32,940	86.4	11.8	31,701	4,979	377	522
Grand total..	362,189	26,651	10,733	265,390	47,820	7211	4384	324,805	232,830	41,054	6409	3891	284,184	87.5	16.4	233,526	27,028	4836	6,845

List of Reinstated Steel Hulls

Company and location	Contract No.	Type	Original suspensions—Number	Original suspensions—Dead-weight tonnage	Reinstatements—Number	Reinstatements—Dead-weight tonnage
NORTH ATLANTIC:						
Providence Engrg. Corp., City Island N. Y.....	200	O. tug	5	*	5	*
DELAWARE RIVER AGENCY:						
American International Shipbuilding Corp., Hog Island, Pa.	83	Transport	70	61,600	12	96,000
MIDDLE ATLANTIC:						
Baltimore Dry Dock & Shipbldg. Co., Baltimore	197	Tanker	8	82,400	2	20,600
Baltimore Dry Dock & Shipbldg. Co., Baltimore	206	Tanker	4	24,000	2	12,000
District total	...	.....	12	106,400	4	32,600
SOUTHERN PACIFIC:						
Hanlon Dry Dock & Shipbuilding Co., Oakland, Cal.	442	Cargo	6	32,100	3	16,050
Long Beach Shipbuilding Co., Long Beach, Cal.	311	Cargo	2	17,600	2	17,600
Southwestern Shipbuilding Co., San Pedro, Cal.	425	Cargo	8	70,400	3	26,400
District total	...	.....	16	120,100	8	60,050
NORTHERN PACIFIC:						
Albina Engine & Machine Works (Inc.), Portland, Oreg.	441	Cargo	4	14,800	2	7,400
Ames Shipbuilding & Dry Dock Co., Seattle...	315	Cargo	6	52,800	4	35,200
Columbia River Shipbuilding Corp., Portland, Oreg.	302	Cargo	6	52,800	4	35,200
Northwest Steel Co., Portland, Oreg.....	458	Cargo	10	88,000	4	35,200
District total	...	.....	26	208,400	14	113,000
GREAT LAKES:						
Great Lakes Engrg. Works, Ashtabula, O.....	323	Cargo	1	4,050	1	4,050
Whitney Bros. Co., Superior, Wis.....	†216	O. tug	6	*	6	*
District total	...	.....	7	4,050	7	4,050
Grand total	...	.....	136	500,550	50	305,700

Note.—*Tug, no tonnage given.
†Supplemental.

Steel Ocean Tug Contracts

Company and location	Total ships contracted for	To be constructed, exclusive of cancellations and suspensions, No. of ships	No. of ships
NORTH ATLANTIC			
Suspensions:—			
Bayles Shipyard (Inc.) Pt. Jefferson, Long Island, N. Y.....	8	2	6
*Bethlehem Shipbuilding Corp. (Ltd.) (Moore plant) Elizabethport, N. J.	30	16	10
Consolidated Shipbuilding Corp., Morris Hts., N. Y.	3	..	3
Newburgh Shipyards (Inc.), Newburgh, N. Y.....	3	..	3
New Jersey Dry Dock & Transportation Co., Elizabethport, N. J.....	2	..	2
Cancellations:—			
Gahagan, W. H. (Inc.), Yonkers, N. Y.....	10	..	10
Suspension total	..	..	24
Cancellation total	..	..	10
*District total	56	18	34
GREAT LAKES			
Cancellations:—			
Foundation Co., The, Port Huron, Mich.	10	..	10
Lake & Ocean Shipbuilding Co., Cleveland, O..	3	..	3
District total	13	..	13
*Steel ocean tug total...	69	18	47
Suspensions	..	..	24
Cancellations	..	..	23

*Delivered, 4 ships.

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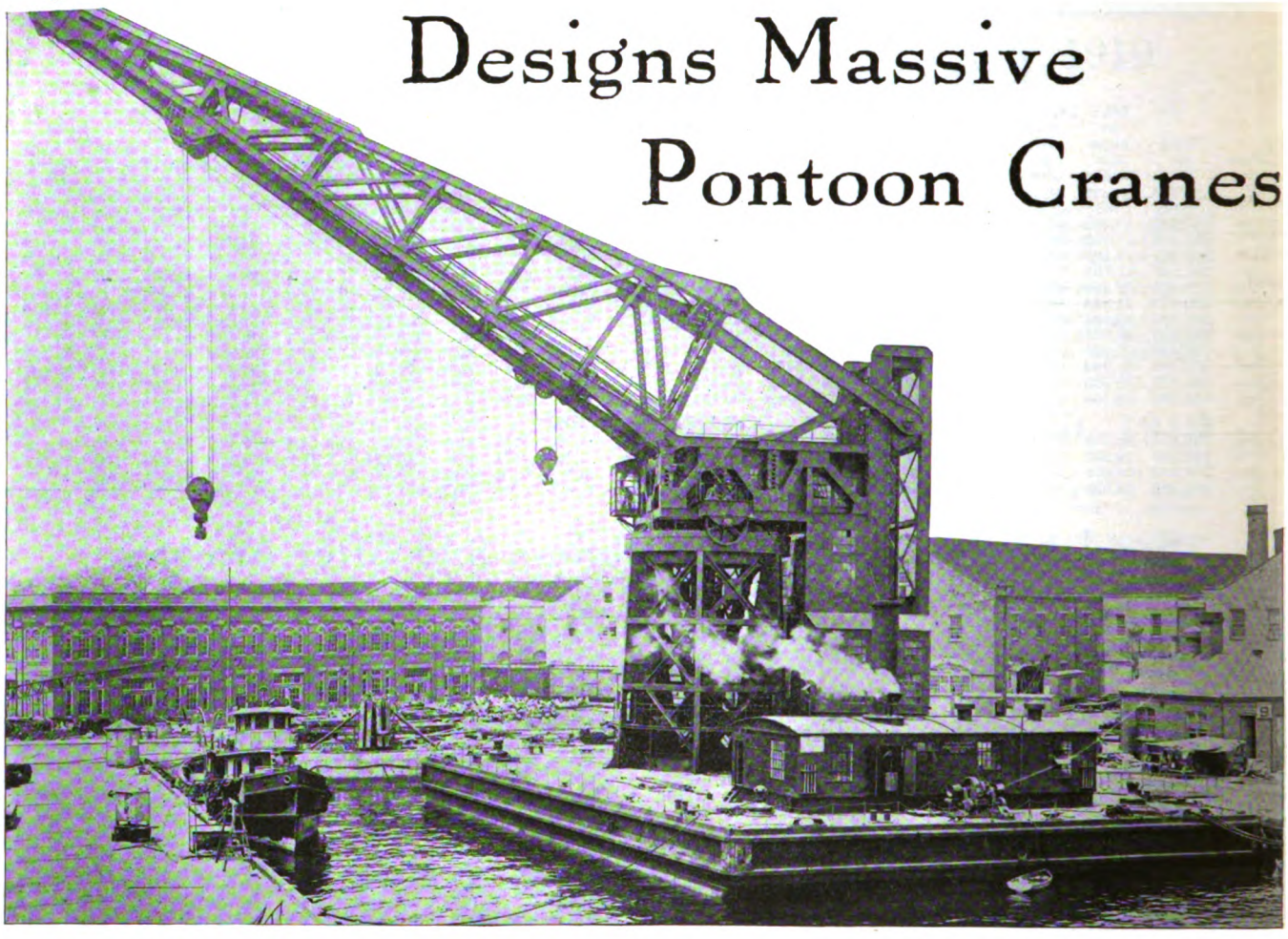
Designs Massive Pontoon Cranes



Floating Revolving Crane of 150-ton Capacity Recently Installed at the Navy Yard, Norfolk, Va.—One of the Largest Cranes of This Type Ever Built

TWO huge floating cranes, said to be the largest ever built in this country, recently were constructed for the United States navy by the Wellman-Seaver-Morgan Co., Cleveland. One has been installed at the Norfolk, Va., navy yard, while the other has been placed in operation at the Mare Island navy yard, Cal. A few of their uses include the placing of boilers, guns and armor plate. One was employed during the war to launch small boats and also to raise a sunken tug.

The cranes are designed to lift 150 tons at a radius of 105 feet and at a speed of 4 feet per minute with a vertical range from 25 feet below to 95 feet above the level of the water. The main hoist is comprised of two seperate units of 75-tons capacity each and the hook blocks being suspended from a fixed position on the jib are arranged to be connected together when handling 150 tons.

A 25-ton capacity hook block is suspended on a trolley which travels along the under side of the jib. This hoist has a vertical range from 25 feet below to 130 feet above the surface of the water and hoists 25 tons at a speed of 12 feet per minute or 5 tons at 60 feet per minute. The jib, carring the maximun load, is luffed from its lower position to the highest point in 15 minutes, and in the reverse direction in about 11 minutes. A complete rotation of 360 degrees under full load conditions requires between 4 and 5 minutes.

Rests on Steel Pontoon

The pontoon which forms the support for the superstructure is steel, 140 feet long, 85 feet wide and 15 feet deep. Full depth collision compartments entirely surround the ponton, the interior of which is provided with longitudinal and transverse bulkheads. Compartments for the boiler plant and generating unit are provided in the after end, and have an open hatchway covered by a deck house. One end of this deck house is enclosed and used as an office.

The crane superstructure is located on the longitudinal center line of the pontoon 42 feet from the forward end. A fixed tower, 43 feet high, is secured to six bulkhead plates extending through the deck of the pontoon, and surrounds the pintle section of the rotating structure.

The three sections of this rotating structure may be designated as the pintle section, the machinery section and the jib. The pintle section rests on a heavy step bearing attached to the deck, and extends above the top of the fixed tower, within which it rotates. The jib is hinged to the front side of the pintle section 60 feet above the deck and the rear side is extended to form a support for the machinery section in which all of the operating units are located.

All of the motions of the crane are controlled from the operator's cab, which is located on the rotating structure just below and to the right side of the jib hinge pin.

The jib is luffed by a screw-operated crosshead which travels in vertical guides at the rear of the machinery section and is connected to the upper chord of the jib by heavy links. The jib is approximately 125 feet long and when in its upper position the total height is 190 feet above the water. Four electrically driven capstans are located near the corners of the pontoon. The equipment also includes two steam driven

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windlasses and the usual chocks, cleats, fair leads, etc. The total floating weight of the crane is about 2600 tons.

Each of the 75-ton main hoist blocks is operated by a hoisting unit consisting of a winding drum connected by three cut spur gear reductions, to a 40-horsepower series-wound motor. An electrically operated disk brake is attached to the motor pinion shaft, and is so connected that it sets instantly when the current is cut off the motor. In addition to this, a mechanically operated band brake for emergency use only is provided. This brake is attached to the intermediate shaft. This mechanism is supported on a heavy cast bed plate. Two 1½-inch steel cables lead from the drum around deflecting sheaves to the 75-ton hook blocks. The gearing is properly proportioned to produce a hoisting speed of 4 feet per minute when handling a 75-ton load and 8 feet per minute at half load. The 25-ton auxiliary hoist block is operated by a hoisting unit located in the machinery section of the rotating structure directly above the main hoist units. This mechanism consists of a drum connected by spur gear reductions to a 40-horsepower series-wound motor. Selective speed gears are introduced into this mechanism, which is required to hoist the full load of 25 tons at a speed of 12 feet per minute or 5 tons at 60 feet per minute. The motor operating this mechanism is fitted with an electrically operated disk brake so arranged as to set instantly when the current is cut off. A lever-operated, mechanical brake is also provided on the intermediate shaft. This mechanism is also mounted on a heavy cast iron bed plate. The control of the motor is identical in design to that of the main hoist units. The 25-ton block is suspended from a movable trolley which travels along the under side of the jib. The mechanism for moving this trolley is located over the auxiliary hoisting mechanism. On account of the inclination of the jib, in its highest position being nearly vertical, the front trolley ropes are required to take practically all of the hook load, and with the boom in its upper position the load is raised as the trolley is moved toward the outer end of the jib. On the other hand very little pull is required in the reverse direction.

ANOTHER CRANE OF THE SAME TYPE IN OPERATION AT THE MARE ISLAND NAVY YARD, CAL.

The mechanism for this motion consists of two drums geared by spur gear reductions to a 40-horsepower series-wound motor. The drums are of different diameters. The ropes from the larger drum lead around deflecting sheaves at the outer end of the jib and connect to the trolley forming a 2-part system. The ropes from the small drum are attached directly to the trolley. The mechanism is mounted on a heavy cast bed plate and is controlled in the same manner as the hoisting units.

The jib is luffed by a crosshead moving in vertical guides at the rear of the rotating structure and connected by two links to the back of the jib. The vertical movement of the crosshead is controlled by two screws, geared by bevel and spur gearing to two 40-horsepower series-motors.

The thrust on the screws is carried by two conical roller bearings, each of which is required to withstand a load of about 450,000 pounds. The screws are of forged steel, 9½ inches in diameter and about 52 feet long, with sufficient thread to produce a crosshead travel of about 37 feet. The entire rotating structure is supported by a single step bearing secured to the deck of the tontoon in the center of the fixed tower. The rotating structure is maintained in a vertical position by a horizontal roller bearing ring completely enclosing the pintle section. Sixty cast steel rollers held in a circular frame comprise this horizontal bearing. A circular path surrounding the rollers is secured to the top of the fixed structure about 43 feet above the deck. A bevel-gear ring, 29 feet in diameter, is secured to the fixed structure and meshes with two bevel pinions carried on the rotating structure at diametrically opposite points.

The pinions are geared by three reductions of cut spur gearing to separate 40-horsepower series motors, and the gearing is proportioned to produce a complete revolution in 4 minutes under full load. The motors and the adjacent gearing are mounted on a cast bed plate, and each is fitted with an electrically operated disc brake.

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Problems of the Vessel Operator

Lubrication of Marine Engines—Computing Cargo Space—Coal Waste Through Boiler Scale—Provides His Own Tow—Cargo Stowage

PROBLEMS of lubrication are often more important with marine installations than with land. At present when the American merchant marine is completing a period of war strain, heavy repairs must be made on the ships. Many of these repairs are due directly or indirectly to improper lubrication.

It has been the practice to permit the engineer to purchase grease as he selected. In some cases, he bought the first thing that came to hand. Often, after putting some of this product on his machinery he would see it foam up and run off, and thus he would learn what was meant by saponification. For marine work a grease that saponifies causes trouble.

Some marine engineers were under the impression that steam cylinder oil could be used with equal results on all types and designs of engines, or that an engine oil would do just as well if any grease would perform its functions in one place as well as another. But that is not the case. The oil experts have at last approached this problem with excellent results and now the shipping companies are being urged to instruct their engineers to specify marine steam cylinder oil, marine engine oil or marine grease as the case may be. Marine greases are compounded to meet the conditions surrounding their use and will prevent any unnecessary wear on the bearing surfaces of the machinery. These oils will, as a matter of fact, saponify but they will lubricate and will not be easily washed off by water. They have an affinity for steel and iron when coming in contact with water. This is particularly important in marine work.

Marine steam cylinder oil is made from a 600 to 650 steam refined stock compounded with acidless tallow. Marine engine oil is compounded oil consisting of about 75 per cent mineral matter and a balance of vegetable oil and lard oil. Marine greases are made with a caustic soda base, petroleum and animal fats. These specifications are essential on marine work because the lubricant should be one that can be worked in close proximity with water. A lubricant which gives excellent results on dry land will not necessarily give equally good results on the sea because of the ever constant possibility of water reaching the machinery. Such oil, when it comes in contact with water, will saponify.

To Compute Cargo Space

The United States bureau of standards has worked out, for the use of shippers, the following formula for computing the hold space required for a shipment of barrels, when the internal contents in cubic feet are known:

$$V = \frac{2.81}{2 - \frac{1}{L} - \frac{1}{w}} \times v \times N$$

where V = total hold space required.
v = internal contents in cubic feet.
1 gallon = 0.134 cubic feet.
L = number of barrels in length of bottom layer.
w = number of barrels in width of bottom layer.
N = number of barrels in shipment.

The coefficient $\frac{2.81}{2 - \frac{1}{L} - \frac{1}{w}}$ varies with the shape and size of the hold. For existing commercial conditions the range of variation of the coefficient is in all probability between 1.5 and 1.8.

Assume a shipment of 134 fifty-gallon barrels, the bottom layer 10 barrels long and four barrels wide:

then L = 10; w = 4,
v = 50 × 0.134 cubic feet.
= 6.7 cubic feet.
N = 134 barrels.

Substituting in the formula

$$V = \frac{2.81}{2 - \frac{1}{10} - \frac{1}{4}} \times 6.7 \times 134$$

= 1.7 × 6.7 × 134.
= 1526 cubic feet of hold space required.

Preventing Boiler Scale

The fuel conservation engineer of the United States fuel administration has issued an open letter dealing with boiler scale prevention. In a table showing the insulating effect of scale, he gives information which may prompt consumers of fuel to take steps to prevent scale. This, it is said, can be done by removing the scale-forming elements from the water before admitting it into the boiler. The insulating effect of scale varies as the square root of its thickness. Comparing the coal wasted from every ton of coal burned with the average thickness of scale in the boiler, it is found: For 1/50-inch, 100 pounds; for 1/32-inch, 140 pounds; for 1/25-inch, 180 pounds; for 1/20-inch, 200 pounds; for 1/16-inch, 220 pounds; for 1/11-inch, 300 pounds, and for 1/9-inch, 320 pounds. Thus, a scale less than ⅛-inch thick causes a loss of 15 per cent of the fuel burned.

Provides His Own Tow

Several new sailing schooners, recently completed on the Pacific coast, have been fixed to carry cargoes of lumber and ties to the United Kingdom. It is the intention to go via the Panama canal. Some of the masters of these sailing craft believe that they can maneuver their vessels close enough to the canal zone, although the winds are generally light, to get a tow into Balboa. One enterprising master plans to purchase a fair-sized launch with good power, carrying it on deck. When he strikes a calm zone he will send the launch overboard to tow his vessel into the entrance of the canal. Among the vessels of this class recently chartered for Europe are the schooners GUNN and WASHINGTON, completing at British Columbia yards, and the Seattle built 4-master MOUNT WHITNEY.

Cargo Stowage

The bureau of research and statistics of the war trade board recently issued a 69-page booklet which gives a complete list of articles constituting ships' cargoes, how they are packed, their gross weight, measurement of the containers and the space taken up in stowage. This stowage represents the number of cubic feet of cargo space in which a long ton of 2240 pounds may be shipped. It is pointed out that existing books on the subject were incomplete and that the object of the present publication was to give shippers and others interested in the stowage of ships full information on the subject.

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Refitting War Fleet is Big Job

Reconditioning Vessels Used for War Service is Taxing Capacity of Repair Yards—Lump Sum Basis of Settlement Recently Adopted

By V. G. Iden

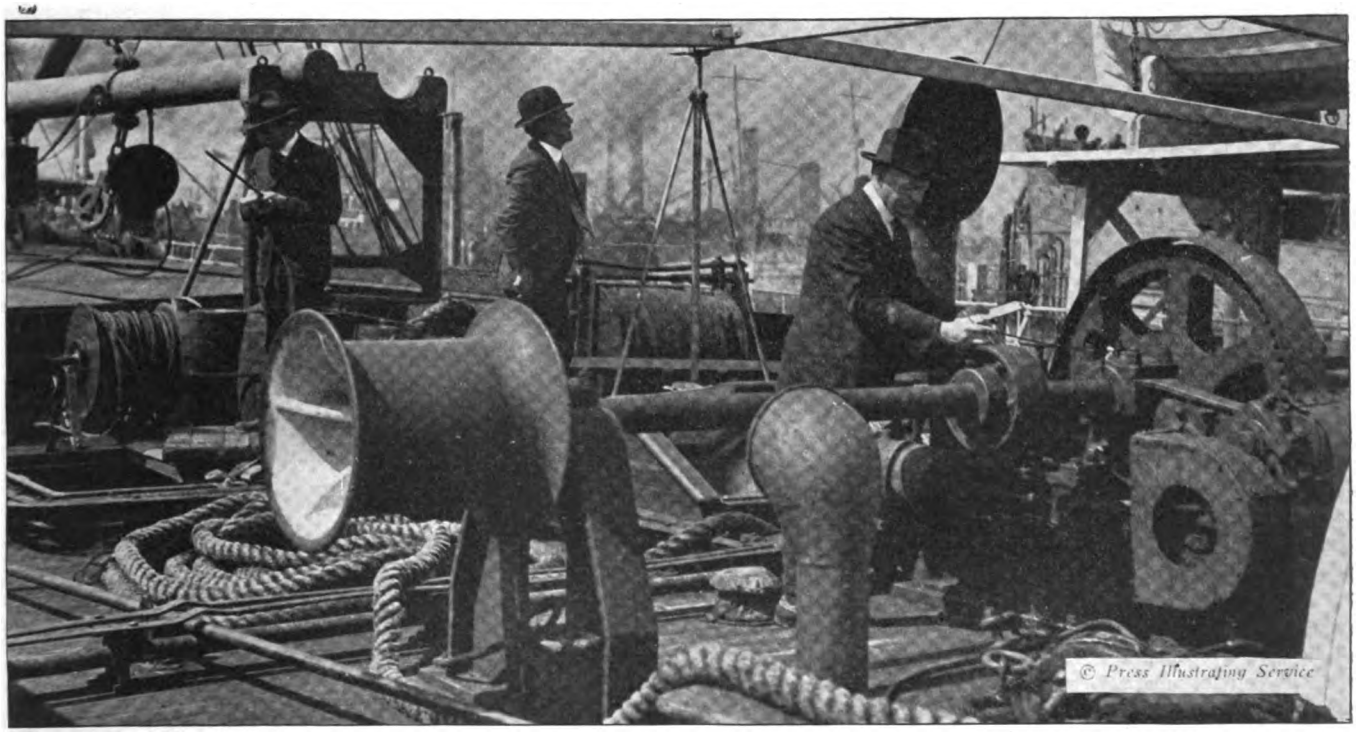
AMERICAN vessels requisitioned for war uses have been employed for many months in bringing the soldiers back home and in transporting emergency cargo. Now that this work is rapidly approaching an end, the government is gradually releasing these ships and returning them to their owners. But the return of a vessel involves much more than painting out the camouflage and removing the navy crew. It means a complete reconditioning that involves a task of large proportions. The requisitioning contract provided not only that the owner should receive an adequate hire for his ship during the war period but that he should receive her back in the condition she was when requisitioned minus the normal wear and tear upon machinery.

The reconditioning of such vessels is now progressing rapidly, yet the amount of work remaining to be done is stupendous. It will be sufficient to keep the repair yards busy for some time to come. The reconditioning work very naturally falls into two classes, that on transports and that on freight vessels. When the first of the merchant ships were returned to their owners following the signing of the armistice, it was deemed essential that the repairs should be made by the navy. While this work was in progress the charter continued in effect. In special instances the navy department permitted the payment of a lump sum to the owners of the ships and the immediate return of the vessel as soon as cleared of navy material. Under this plan the charter stopped before the repairs were completed, but an allowance on this account was made inasmuch as the use of the vessel was impossible until she had been reconditioned.

Owners Make Repairs

At the present time, it is the invariable rule that a lump-sum payment is awarded the owners for reconditioning and the actual repairs are made by the owners themselves. This has worked out to advantage, one reason being that in the case of navy work, labor may be employed but eight hours a day. For a time foreign vessels returned to their owners in American ports were being worked on day and night, in private yards, while American vessels were worked on but eight hours in navy yards. As a result, the foreign vessels got back into commercial service before the American vessels. This discrimination is removed by the adoption of the lump-sum payment policy now in effect. Special machinery was set up for determining reconditioning allowances. The navy has established a body of naval experts known as the demobilization board. To this board is referred all claims of the owners and reports of the surveyors of the ships to be turned back. In consultation with the owners it has been possible to effect amicable settlements and to facilitate the return of the vessels to commercial uses.

In many instances this method of returning vessels has resulted in savings to the owners. For instance, where a teakwood table was to be restored the navy was compelled to pay for a table of that quality but the owners might replace it with a pine table. That, of course, is an exaggerated example but represents the principle. Furthermore it was invariably the rule that none of the equipment installed by the navy was permitted to remain on the vessel. All navy material was removed. Should any of it be allowed to remain, the owners were compelled to accept a deduction from the total reconditioning allowance. It is understood that in some few instances some little navy equipment was purchased in this way with satisfactory results to the owners.



THE FIRST AND MOST IMPORTANT STEP—GOVERNMENT SURVEYORS INSPECTING A VESSEL TO DETERMINE THE AMOUNT OF RECONDITIONING WORK INVOLVED

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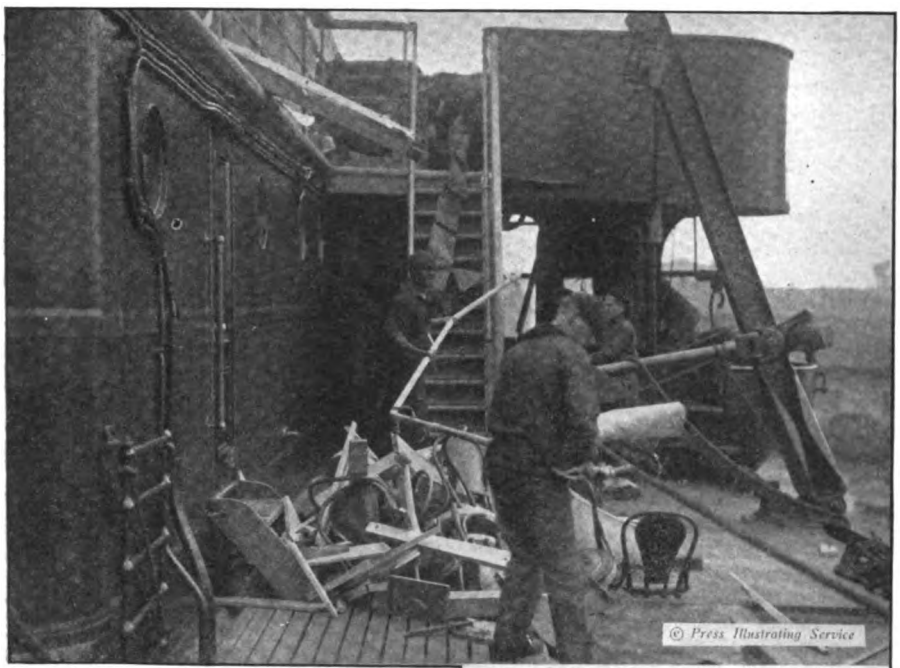
The amount of reconditioning to be done to the requisitioned merchant ships can best be estimated by the alterations made to the vessels when taken over for war purposes. In general, the ships were provided with gun mounts and magazine stores. Secondly, the crew quarters were enlarged and additional



REMOVING DECK INSTALLATION PREPARATORY TO REFITTING

mess and provision spaces provided. The size of the crews carried by the navy was much larger than a merchant crew, even aside from the normal equipment of gun crews. During the war every additional man on the ship gave the vessel that many more eyes to scan the sea for submarines or similar dangers. But although the crew complement was so greatly augmented, the navy tried not to cramp the men in their quarters. Cargo space was often sacrificed and extra crew quarters built in the 'tween decks. It was the aim of the navy to give each man at least 125 cubic feet of space. In reconditioning the vessels, of course, these extra quarters must be removed.

Alterations Were Extensive

The gun platform on a freight vessel was generally the open type, with about 1-inch openings, with one fire control station to which a voice tube led, this station being situated on the midship line of the vessel, and on the forward side of the after platform, and the after side of the forward platform. In some instances, the flag staff was removed out of the fire-range of the guns and these, of course, must be replaced.

Ammunition hoists from the magazines to the gun platforms, with davits having at least 8-foot clearance over the platform coamings, were provided. The magazines were provided with a flooding system which was not coupled to the firelines, but ran either direct from the engine room or was connected to the sanitary lines.

Shelters for a minimum of six men per gun were provided near the guns on vessels where the crew was normally quartered in such a location that the gun could not be reached by the crew in 15 seconds. These shelters were only provided when the crew was quartered at the opposite end of the vessel from where the gun was located. Where the installation of the forward gun platform and gun was such as to necessitate the regular use of the upper bridge by the quartermaster so as to obtain an unobstructed view, it was considered desirable to provide an enslosed shelter for him also.

In view of the need of oil in France, many of the vessels were fitted out to carry oil cargoes in the double bottoms, where this could be none without interfering with the fresh water supply. A 6-inch filling and discharge pipe was provided for the discharge of the ballast pump so that it could be used for filling or discharging the oil carried in the double bottom tanks. The manhole covers on these tanks were taken off, trued up and made absolutely oil tight. Vent pipes from all four corners of the double bottoms carrying oil were carried up through the main deck, and a return bend and screen placed on the top of each.

Carried Extra Lifeboats

The life-boat capacity was increased to accommodate one-and-one-half times the crew, for it was presumed that at times the lifeboats of only one side might be available. Crows nests suitable for holding two men were installed on both fore and aft masts, with proper shelters to protect the occupants from rain and snow. Three hatch covers were provided for every hatch on the ship.

Auxiliary electrical generating sets were installed on vessels passing through the war zone. All vessels were compelled to carry wireless, and storage batteries were provided. Alarm bells were installed. These were operated by a switch from the bridge and bells were located in all parts of the ship where

REPAIR WORK ON FORWARD DECK WHERE NAVAL GUNS WERE MOUNTED

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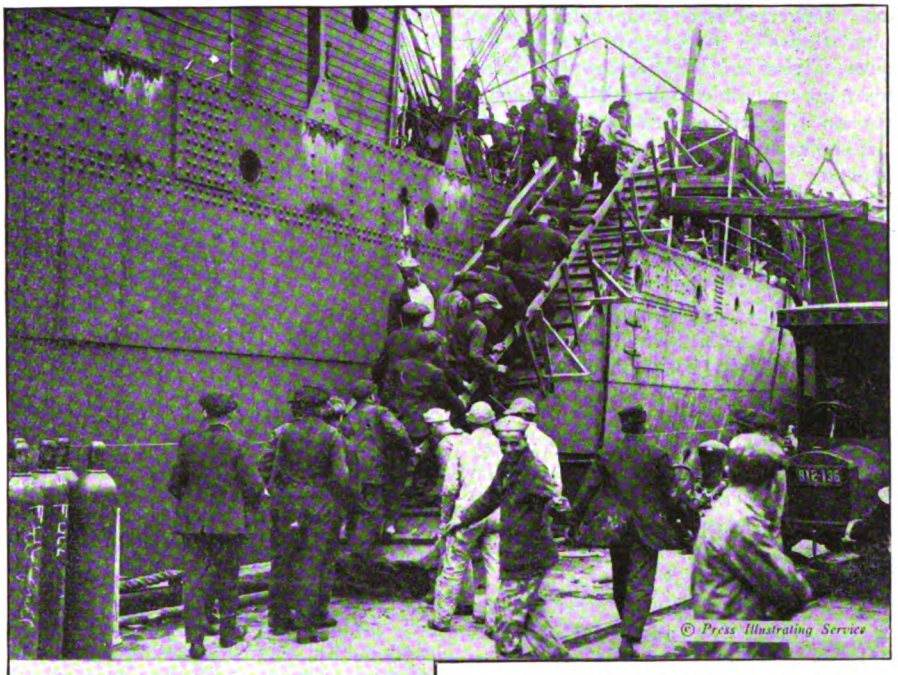
any of the crew were likely to congregate. Small 6-volt binnacle lights were installed, operated on a switch in easy reach of the helmsman. Naturally the private owners of the vessels are not requesting that these war safeguards be retained, because to do so means that the navy exacts an allowance for installation. The owners are more concerned in getting the ships back "as were."

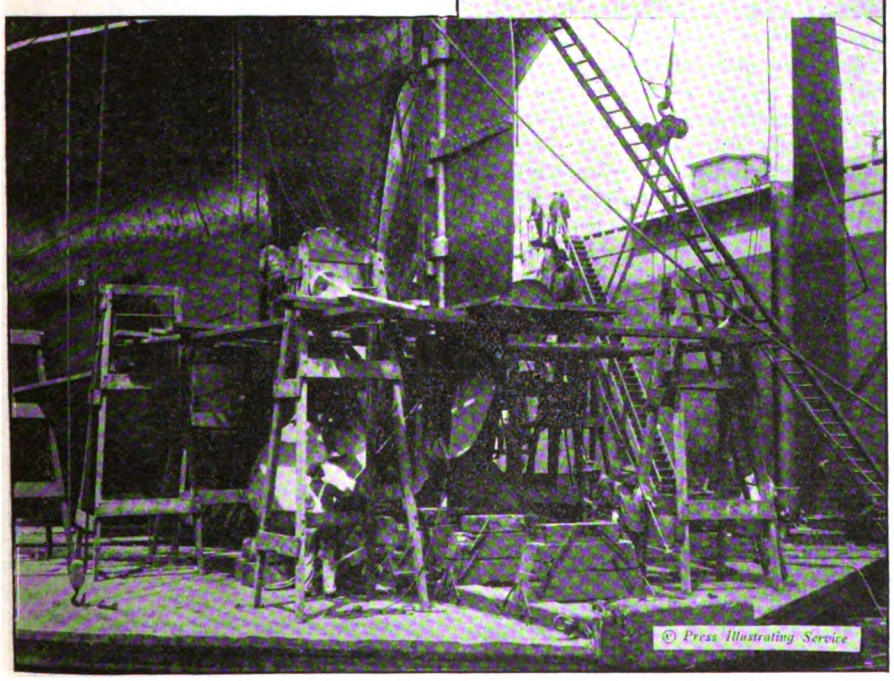
When coal became scarce in Europe, all vessels from this side were required to carry a sufficient quantity of bunker for the return trip. This necessitated the enlargement of the bunker space by sacrificing cargo tonnage. The bunker capacity required was for sufficient coal for a round trip and 10 lay days in a foreign port.

Water Supply Was Important

The fresh water capacity was required to be sufficient to take care of the boiler feed makeup as well as the consumption of the crew. In figuring this, the evaporator was considered. The fresh water tanks were required to hold water for drinking and cooking purposes, figuring at least 10 gallons of water per man per day. These specifications were rather important as the size of the crews was so greatly augmented. For the same reason, the galleys of the ships were enlarged. A standard galley equipment consisted of a stove of two fires and two ovens, top about 6 feet long; a coffee urn of 20-gallon capacity; steam kettle of 30-gallon capacity; hot water tank with steam coil; dough trough; sink with steam and water connection; fresh water connection, either by pressure or pump, and suitable lockers and racks for necessary galley equipment. The crew equipment was one of the larger items of fitting out and naturally in reconditioning this becomes again of major importance. Every ship was allowed $250 for a library and shelving or bookcases were provided. Staterooms were provided for the captain, executive officer, first watch officer, paymaster, chief engineer, paymaster's office, ship's office, sick bay, wireless, and one for brig. Where possible, separate staterooms were provided for the second and third watch officers, although at times they occupied the same room. The same was true of the second and third assistant engineers. Toilets, baths and showers were also provided in abundance. Special attention was given to storerooms. For a crew of 100 men, the minimum capacity provided was 500 cubic feet for clothing and small stores, 200 cubic feet for ship's stores, 6000 cubic feet for general stores, 500 cubic feet for meat box, 300 cubic feet for chill box exclusive of ice capacity, 200 cubic feet for vegetable space, and 400 cubic feet for deck locker space.



REPAIR GANG BOARDING VESSEL TO BE REFITTED



HULL INSPECTION AND REPAIRS ARE GENERALLY NECESSARY

Many Voice Tubes Installed

Telephones were not installed on freight boats except in unusual cases. Voice tubes, made of 2½-inch iron pipe, were installed from the bridge to each gun, and from both forward and aft crows nests to the bridge. Speaking tubes of not less than 2-inch tubing were installed between the bridge and engine room, and between the wireless room and chartroom; bridge and commanding officer's rooms; engine room and chief engineer's room. In order to avoid cutting any more holes than necessary in the deck floors, walls, etc., speaking tubes were frequently made to run around. The expense of installation was often enhanced but it obviated many repair costs when the vessel was reconditioned before turning back to her owners.

Care was taken not to deface the vessel any more than necessary in the conversion to public use. Orders were issued positively forbidding the cutting of any holes through watertight bulkheads or through the shell of vessels for any purpose whatsoever, unless express permission was obtained. This included all cutting of those portions

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of the vessels which might be required in the work of installing horse stalls or any other piece of apparatus. Even transforming vessels into animal transports did not afford excuse to cut away any of the structure of a vessel. Stalls were made in units and fitted in the 'tween deck space.

In the case of some of the freight boats converted into troop ships it was found desirable to cut port holes in the lower strakes of the vessel. By doing this it was possible to install troop quarters on the lower decks. When these port holes were cut it was presumed that they could be welded again when the ship is to be returned.

First Stoppage of War Work

The armistice had not been signed many days before the navy issued instructions to begin removing equipment from the freight boats to conform to peace standards. These instructions, issued Nov. 29, 1918, called for the removal from freight vessels as they become available, "all guns, ammunition and ordnance equipment except small arms, small arm equipment and explosive and distress signals. Remove gun platforms and as much of the foundation as possible without involving entensive repairs to deck or additional expense. Make necessary alterations to utilize magazines as cargo space. Remove such electrical equipment pertaining to fire control and convoy features as can be readily salvaged." On Jan. 24, 1919, orders were issued to stop all work incident to the enlargement of crew quarters, as it was intended such quarters should ultimately conform to mercantile specifications. During all of this time special naval equipment on requisitioned merchant ships was being salvaged.

The government has consistently carried out its duties of salvaging special equipment but that has little if any bearing upon the actual reconditioning of the vessel. Often the removal of the special equipment would leave the ship in a barren condition, and to return her "as was" it would be necessary to restore all of the equipment the vessel had when taken over by the government. A notable case of this is the passenger ship, ST. PAUL. Most of the interior arrangements of this vessel were taken out and orders had been issued to convert her into a troopship. The armistice was signed before this was done, however, and the vessel was taken back by the owning company in the condition she was at the time. The reconditioning will be done by the owning company and, according to well founded reports, the vessel will undergo extensive repairs and improvements during this process.

Naturally the lump-sum payment plan adopted for reconditioning ships will prove of theoretical benefit to the American merchant vessels. At the port of New York alone, it has been estimated, more than 100 vessels are awaiting the convenience of repair yards that they may be turned from coal-burners into oil-burners. Others had their engines rebuilt and some had extensive alterations made to their interior arrangements.

Other than the general alterations made to fit vessels for war service, special alterations were made in but a few cases. Some 10 or more tankers, for instance, were equipped to carry troops and airplanes as well as bulk oil. For this purpose skids giving a clearance of six feet were built to the length of the upper decks and on top of these skids about a dozen airplanes could be lashed and transported securely across the Atlantic. The 'tween deck space was utilized to build quarters for troops by the installation of lavatories, and by adding to the galley equipment. In utilizing the 'tween deck space for troop quarters, however, it was necessary to trunk up the hatches at each end of the ship in order to provide proper ventilation.

When it was determined to transport complete set-up locomotives, the ore boats of the Ore Steamship Co. were first used. Little reconstruction had to be done to these vessels because the hatches were large enough to admit the complete locomotives and tenders. Only heavy pine boards were placed in the holds of the ships and the flanges of the locomotive wheels rested in these. The success had with this form of packing prompted the government to utilize some ordinary freight boats also for transporting set-up locomotives. In their case it was necessary to enlarge the hatches and cut away the decks.

How Gas Was Transported

Some few freighters were fitted out for the transportation of gas. Two of the Porto Rico line freighters, for instance, carried nothing but mustard gas during the war. In their case, it was necessary to make the cargo spaces gas tight to make certain that no gas would leak into the engine or boiler rooms. Suction blowers were installed to draw the foul air from the false bottoms. These blowers were carried to the upper decks, over the sides and down the outside into the water.

In the animal transports, the stalls were not built in, but constructed in sections and each bolted into place. This was a temporary expedient but it served its purpose and at the same time did less damage to the vessel than would have been the case had the stalls been built in the regular way. That is an important matter just now when the government is confronted with the necessity of reconditioning the ships or making a settlement on reconditioning. The alterations made by the government were in most cases temporary equipment installed in a temporary way.

Since the opening of spring, rapid progress has been made with the salvaging of government material on board and demobilizing the freight vessels. There still remain in the service of the government, however, a vast number of passenger vessels which are being used as troop transports. The only new thing of importance presented in connection with those boats is that the 'tween deck spaces have been fitted up with standee berths, lavatories, special galleys, etc., all of which material will be salvaged. In practically all such ships the old passenger equipment has been removed in its entirety.

Book Review

Simple Rules and Problems in Navigation, by Charles H. Cugle; cloth, 289 pages, 6 x 9 inches, published by E. P. Dutton & Co. and furnished by THE MARINE REVIEW for $3.

The author is a master mariner who sets forth that the object of the book, which is in its second edition, is to lay before the student all the rules and problems of navigation used in every day work at sea, with short definitions of the theory of navigation and other useful information with which the student and young officer should be familiar.

The first chapter of the book is devoted to useful definitions and information, weather bureau signals, life saving data, code systems, cargo stowage, compass adjustment and ship's business. The subjects are explained thoroughly and form a good groundwork for subsequent chapters.

Navigation arithmetic is next explained. On his mastery of this subject depends in a great degree the proficiency of the navigator and the rules used are fully explained and worked out. Dead reckoning is next treated. The conversion of true courses into compass courses and vice versa is explained by means of several practical examples. Mercators sailing, middle latitude sailing, latitude by meridian altitude of the sun, etc., are fully explained by examples. The subject of longitude is next taken up. The problem of finding Greenwich date and time is explained, followed by practical examples. Noon position sights, the deviation by azimuth of the sun, deviation by amplitude, latitude by polaris, latitude by meridian altitude of planets, etc., are a few of the other subjects discussed.

The whole subject of navigation is exhaustively treated in clear language. Thus the book will prove of value both to students and navigators as well.

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Russia Must Develop New Fleet

Spanish War Losses—Allies Lost 2774 Ships—Japanese Hospital for Sailors —Plans Dutch Shipyard—German Export Data—Indian Shipbuilding Situation

ALTHOUGH the Russian navy met with disaster during the Russo-Japanese war, the merchant fleet came off lightly. From 1901 to 1903 the merchant tonnage increased from 789,253 to 974,178 British tons register, the increase from 1906 to 1915 being from 929,600 to 1,169,000 tons, about 25 per cent. With this tonnage the Russian mercantile marine occupied a place between Sweden and Spain, with 2.4 per cent of the world's shipping. It is not surprising, therefore, that the majority of Russia's trade was carried in foreign bottoms, Russia having to pay annually from $50,000,000 to $75,000,000 abroad. The outbreak of war surprised a part of the Russian merchant fleet in the ports of the central powers. The tonnage seized by the latter represented a comparatively slight loss, although a number of the best vessels were included in this tonnage. A much greater proportion of the Russian merchant fleet was taken over by and incorporated in the navy, and not less than half of all the ships and steamers over 1000 tons burden were lost for trade purposes. Several Russian steamers were in foreign waters when war broke out, and were thus cut off from the Baltic and the Black sea. This percentage proved very valuable to Russia's allies during the war. Further, a number of important ships were lost through U-boat activities, mines, etc.

According to the calculations of a Dutch insurance company, some 42,000 tons of Russian shipping have been sunk by the U-boats, this tonnage representing about 4 per cent of the Russian merchant fleet at the outbreak of war. Russian calculations made at the end of 1917 gave the total tonnage lost in this way as 90,000, and, including losses in 1918, this lost tonnage was increased to 95,000 tons, or about 8 per cent of the entire Russian tonnage as at Jan. 1, 1915. To this must be added the ships used for war purposes, of which the number is considerable.

The question has now been raised as to the manner in which this lost tonnage can be replaced and a new merchant fleet created. For this purpose, the German, Austrian and Turkish tonnage confiscated since the war broke out, together with new vessels built (120,000 to 150,000 tons) must form the basis. If these vessels remain in the possession of Russia they alone will be capable of making good the losses. Like other countries, Russia will have to turn her attention to shipbuilding. Before the war about 80 per cent of her merchant fleet was built abroad, but now the acquisition of tonnage from abroad is doubtful. It would also seem necessary to release all ships taken over for war purposes, even though, of course, a number of such ships will prove unseaworthy. Already some 22 such vessels have been released and represent a tonnage of 24,000, which shows that the government realizes the necessity of this action. It is a moot point whether the increase of tonnage thus brought about will go far to meet the situation.

Press notices in Russia lead to the belief that the majority of such ships will be scrapped. Further particulars as to the extent of this scrapping are not available, more particularly as concerns the Black sea fleet. Unknown also is the fate of those vessels which at the outbreak of war were in foreign waters and may since have been confiscated by Russia's quondam allies to cover the losses sustained by these countries on account of the repudiation of the Russian loans. A number of Russia's best steamers are involved in this respect.

The present position of Russia's merchant fleet is, therefore, anything but satisfactory. Russia, then, must do everything possible to promote shipbuilding with the object of creating a new merchant fleet, in order that she may have sufficient tonnage available and thus be freed from the necessity of spending $50,000,000 for shipbuilding purposes in foreign countries. (*Hansa.*)

War Cost Spain 51 Ships

A recent issue of *España Económica y Financiera,* Madrid, gives an account of the Spanish merchant marine, in which the losses suffered during the war are reviewed. The report takes into consideration only vessels of 50 tons or more. It is stated that the number of ships of 250 tons or larger which were torpedoed from the beginning of hostilities until June, 1918, aggregated 51, with a total tonnage of 123,176. Mines accounted for six others of like size, aggregating 16,731 tons. Four of the six vessels sunk by mines were lost in 1916, but the greatest loss by submarines occurred in 1917, when 22 vessels were torpedoed, as compared with 12 in 1918, 16 in 1916, and only one in 1915.

Great efforts have been made in shipbuilding, and in order to prevent further losses three successive royal decrees have been issued restricting the foreign sales of Spanish tonnage. The first one, promulgated Jan. 7, 1916, prohibited the sale to foreign countries of vessels over 500 tons; the second, under date of Jan. 26, 1917, extended the prohibition to vessels of more than 250 tons; and in December, 1917, it was forbidden to sell boats of any kind or capacity to persons or countries outside of Spain.

Allies Lost 2774 Ships

The British ministry of shipping recently announced that the number and tonnage of allied merchantmen lost through enemy activity in the war were as follows:

	No. ships	Tonnage
Great Britain	2197	7,638,000
France	238	697,000
Italy	230	742,000
Japan	29	120,000
United States	80	341,000
Total	2774	9,538,000

In addition to the British ships above, 20 British vessels, aggregating 95,000 tons, were lost on admiralty service.

Jap Sailor Hospital

Plans are being completed by the Nippon Yusen Kaisha for the establishment of a large hospital in Japan where medical treatment may be given the officers and crews of the company's more than 100 vessels, according to advices recently received from the Orient.

Approximately $600,000 will be spent by the Japanese shipping concern on the proposed hospital, which will be the best equipped in the Orient. It will be located near Ikuta river, not far from Kobe, where property has been purchased for $60,000.

Baron Rempei Kondo, president of the Nippon Yusen Kaisha, will make an extended trip through Europe and North America with a view of making investigations regarding various relief institutions especially adapted for mariners.

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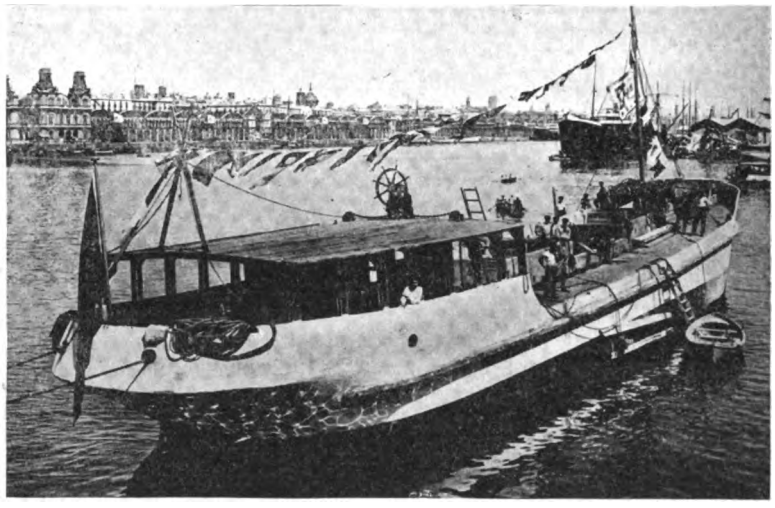

The illustration shows a concrete vessel, the initial craft of this type to be built in Spain. The vessel is a product of the Works and Pavements Corp., Barcelona. This corporation makes a specialty of concrete work and began the construction of concrete ships early this year. An account of this work was published in THE MARINE REVIEW, May, 1918. Notwithstanding that the initiative in developing concrete for big ocean going vessels was taken by the United States, several European countries are now building vessels of this type. England is making rapid strides in this line and has a number of yards devoted to concrete shipbuilding.

The company also intends to add three new steamers to its fleet for service between Japan and Seattle. The new ships will have a speed of 20 knots and a gross tonnage of 20,000. The first of the vessels will be built in England and the remaining two in Japan.

Plans Dutch Shipyard

Dutch newspapers report that for the purpose of constructing a huge dockyard, the N. Y. Wiltons Machine Factory, Scheepvart, has acquired about 175 acres of land between Vlaardingen and Schiedam. The ships are not to be built on slips, but in fixed docks. At present only one dock will be constructed, in which at the same time two ships, 650 feet long and about the same size as the ROTTERDAM and the NIEUW AMSTERDAM, and eight small ships, 328 feet long, can be constructed. If the new method of building devised by the company answers expectations, a similar dock for the construction of large ships such as the VATERLAND, also a great floating dock to take ships of 40,000 tons, will be taken in hand. After completion of the whole constructions, the dockyard will be the largest in Europe. —*Kolnische Zeitung.*

Mexican Tank Ship

The Aguila Oil Co., Tampico, Mex., has just placed in service the largest tank steamship ever set afloat. The vessel was built in England and has a carrying capacity of 135,000 barrels of oil. It made its maiden voyage from Liverpool to Tampico. One of its novel features is the splendid quarters provided for passengers. It is fitted up to carry 14 passengers. The big tank steamship is called the SAN FLORENTINO and easily makes 12½ knots an hour.

German Exports of Shipbuilding Material

Before the war Germany exported considerable quantities of shipbuilding materials, mainly plates, ingots, and large forgings and castings. The chief markets were the Netherlands, Japan and Scandinavia. Holland, which mainly used this material for canal and river ships built for the Germans, took about 100,000 tons before the war, Japan 30,000 tons, Denmark 30,000, Norway 25,000 and Sweden 20,000. The requirements of these countries were in the main covered by Germany in the absence of sufficient production of such materials in those countries. These requirements will still hold now that the war is over, except that both Japan and Sweden have developed their steel industries to an extent sufficient to meet their needs. The Netherlands, Norway and Denmark, however, have practically no steel production. It is estimated that there is every ground for anticipating a big trade in this direction in Germany. Germany's exports of shipbuilding materials to these countries (excluding Japan), is said to have proceeded uninterruptedly during the war. Meanwhile the productive capacity of shipyards in these countries has extended. If they are assured sufficient imports of material, the annual production of Dutch yards, which before the war had attained 100,000 tons, should reach nearly 300,000 tons. In Norway, where at least 20 large steel shipbuilding yards are established, the production should attain some 250,000 tons. Sweden's annual output, amounting before the war to 20,000 tons, is now 150,000 tons.

Increased activity is shown in the Japanese petroleum industry. Drilling for oil is soon to start in the naval oil reserve fields in Formosa, as well as in Nairyo and Kosempo. The Akita Mining college is to inaugurate a course in petroleum engineering, which is said to be the first of its kind in Japan.

Few Yards in India

India believes the difficulties to be overcome too great to warrant the planting of a shipbuilding industry in that country, despite the request of the British government. This was the reply which has been sent England following a request for a report on the possibilities of building cargo steamers in India. The main difficulties, it was pointed out, are "encountered in providing the necessary materials and skilled labor, in the comparative undevelopment of the ship construction industry in India, and in the fact that such engineering productivity capacity as exists is already engaged in necessary local pursuits.

To build ocean-going ships in India would necessitate the importation of steel plates, boilers, most of the propelling machinery, and the greater part of the structural steel. The government of India, however, is prepared to help and encourage the construction by private enterprise of such wooden sailing ships, with or without auxiliary power, as can readily be built in India. "Those will, no doubt," said the official announcement issued at Simla, "render useful service, more particularly in facilitating the coastwise trade, thus relieving to some extent the pressure on the railway transport system. It is also hoped that as soon as circumstances permit it will be possible to inaugurate the building of ocean-going steamers, and the question is therefore receiving the earnest attention of the goverment of India."

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June Lake Levels

The United States lake survey reports the monthly mean stages of the Great Lakes for the month of June, 1919, as follows:

Lakes	Feet above mean sea level May	June
Superior	602.25	602.45
Michigan-Huron	581.38	581.50
St. Clair	576.38	576.45
Erie	573.69	573.77
Ontario	247.27	247.95

Lake Superior is 0.20 foot higher than last month, 0.34 foot higher than a year ago, 0.24 foot above the average stage of June of the last 10 years.

Lakes Michigan-Huron are 0.12 foot higher than last month, 0.45 foot lower than a year ago, 0.68 foot above the average stage of June of the last 10 years.

Lake Erie is 0.08 foot higher than last month, 1.23 feet higher than a year ago, 0.92 foot above the average stage of June of the last 10 years.

Lake Ontario is 0.68 foot higher than last month, 0.94 foot higher than a year ago, 1.06 feet above the average stage of June of the last 10 years.

June Ore Shipments

Shipments of iron ore from the Lake Superior district in June aggregated 7,980,839 tons, a decrease of 1,941,021 tons from the record of June, 1918. Shipments in that month were 9,921,860 tons. The lake fleet up to July 1 had moved 16,008,419 tons against 18,949,730 tons to July 1, 1918, a decrease of 2,941,311 tons. The percentage of decline in June was 19.56 against a proportional decline so far for the present year of 15.52 per cent. Shipments by ports in June and up to July 1 are shown in the following table:

Port	June, 1919	To July 1, 1919
Escanaba	759,647	1,414,527
Marquette	296,127	447,876
Ashland	951,287	1,768,292
Superior	1,889,294	3,241,561
Duluth	2,947,651	6,699,038
Two Harbors	1,136,833	2,437,125
Total	7,980,839	16,008,419
1919 decrease	1,941,021	2,941,311

Lake Erie Receipts

Out of a total of 7,980,839 tons shipped from upper lake ports in June, Lake Erie ports received 5,998,721 tons, as shown by figures compiled by THE MARINE REVIEW. The balance on dock July 1 was 6,310,141 tons against 6,262,997 tons on July 1, 1918. Detailed figures are:

Port	Gross Tons
Buffalo and Port Colborne	755,480
Erie	134,269
Conneaut	1,195,611
Ashtabula	1,395,112
Fairport	366,016
Cleveland	1,235,355
Toledo	503,356
Huron	210,962
Toledo	137,980
Detroit	64,580
Total	5,998,721

Soo Canal Report

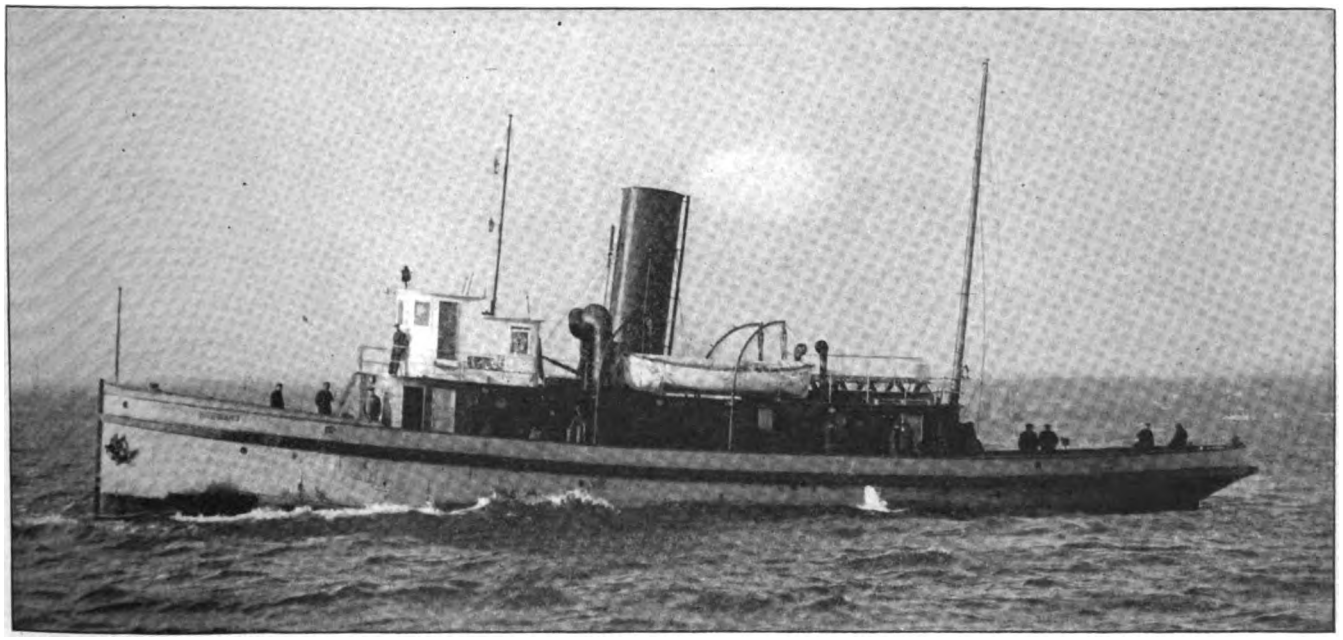
The total movement of freight through the Soo canal for June was 11,219,416 net tons which is a decrease of 780,104 net tons when compared with shipments for June of last year of 11,999,520 net tons. Last month's shipments are 2,005,747 net tons behind the movement for June, 1917, which month had the largest total for a like period in the last six years. The tonnage comparison figures for the past six years follow:

	Net Tons
June, 1919	11,219,416
June, 1918	11,999,520
June, 1917	13,225,163
June, 1916	12,960,469
June, 1915	8,360,832
June, 1914	8,588,081

Of the total freight carried in June, 10,697,197 tons were handled through the United States canal while 552,219 tons passed through the Canadian canal.

The following tabulation gives the figures in detail for 1919 and 1918:

	To July 1, 1919	To July 1, 1918
EASTBOUND		
Lumber, M. ft. B. M.	72,379	87,777
Flour, barrels	1,942,154	2,144,730
Wheat, bushels	52,227,167	11,107,550
Grain, bushels	20,241,316	11,007,981
Copper, net tons	11,966	25,698
Iron ore, net tons	15,766,450	18,816,263
Pig iron, net tons	110	.....
Stone, net tons	14,810	7,790
Gen'l merch., net tons	21,629	15,665
Passengers, number	4,436	2,114
WESTBOUND		
Coal, soft, net tons	4,922,546	3,615,079
Coal, hard, net tons	618,327	435,102
Iron ore, net tons	32,397	26,632
Mfgd. iron and steel, net tons	40,260	11,051
Salt, net tons	32,834	25,590
Oil, net tons	147,798	80,425
Stone, net tons	28,695	156,155
Gen'l merch., net tons	129,261	121,907
Passengers, number	4,941	2,027
SUMMARY		
Vessel passages, number	6,170	6,052
Registered tonnage, net	17,723,916	18,831,416
Freight:		
Eastbound, net tons	18,206,787	19,776,612
Westbound, net tons	5,952,118	4,471,941
Total freight, net tons	24,158,905	24,248,553



STEEL SEAGOING TUG MURRAY STEWART RECENTLY LAUNCHED BY THE PORT ARTHUR SHIPBUILDING CO., PORT ARTHUR, ONT.—SHE IS 126 FEET LONG, 26 FEET BEAM WITH A MOLDED DEPTH OF 16 FEET 5 INCHES. HER TONNAGE IS 240 GROSS, 80 NET

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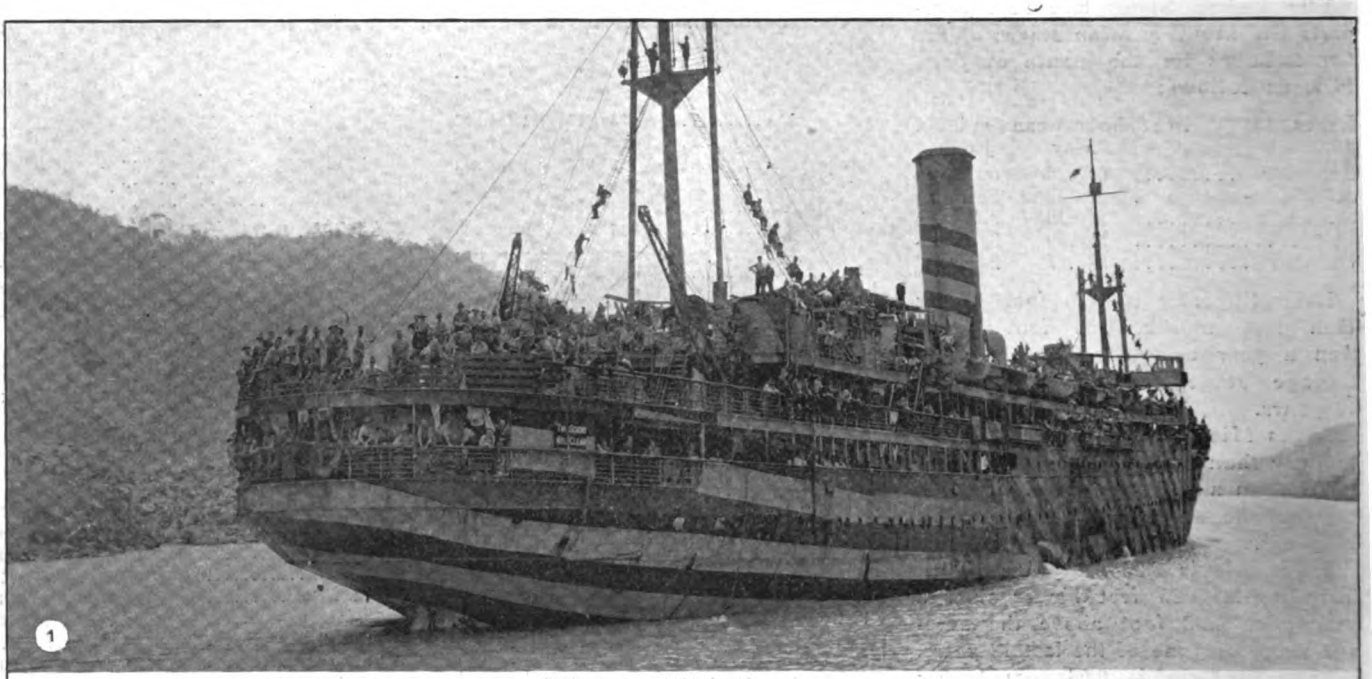
Photographs From Far and Near



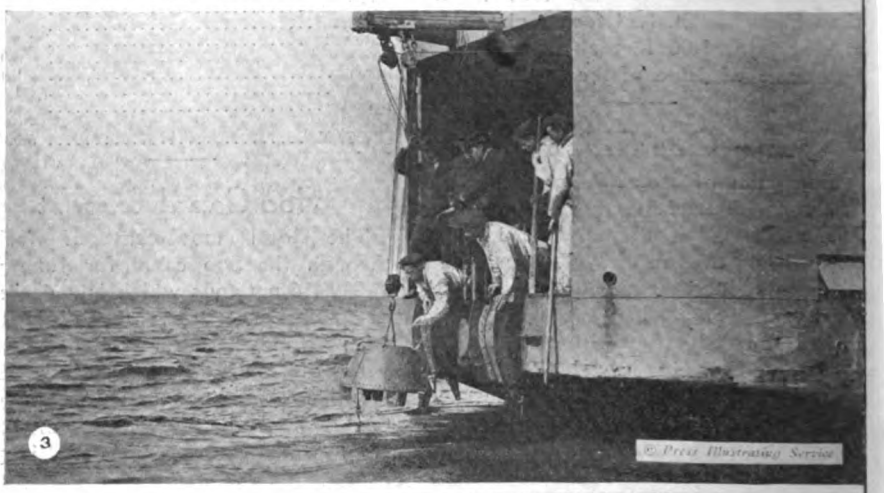
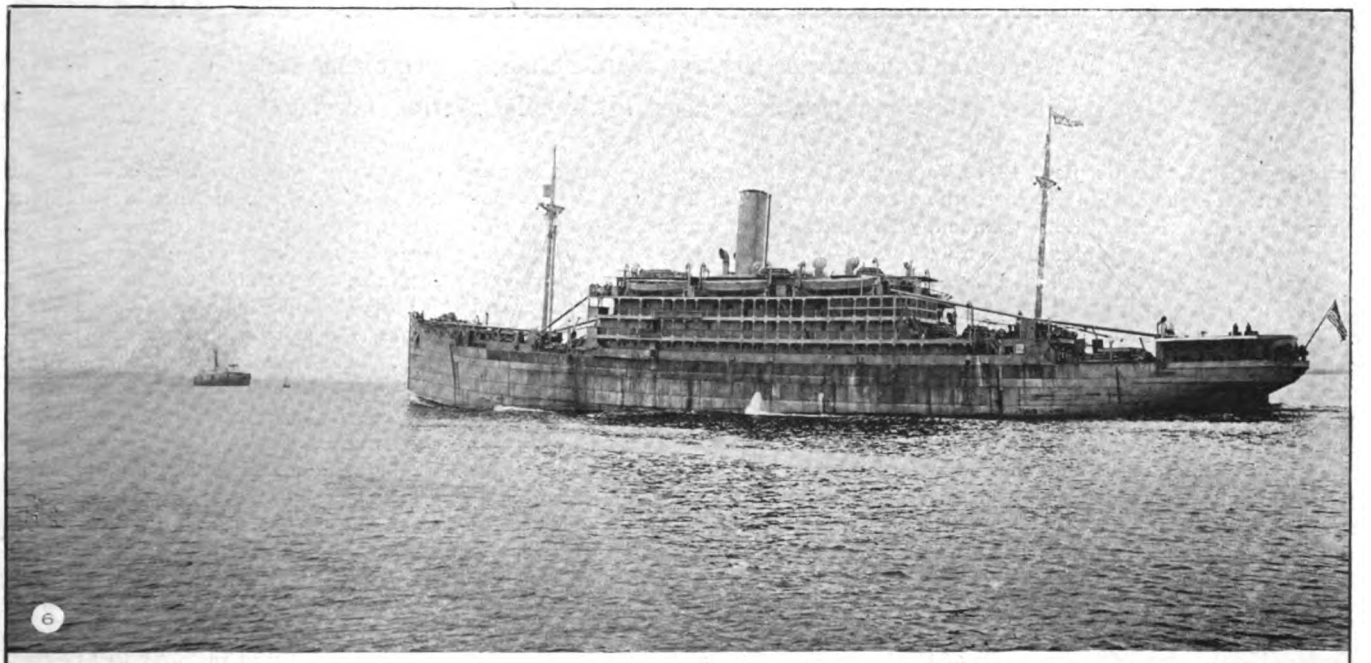


FIG. 1—BRITISH TROOPSHIP WILLOCHRA IN THE PANAMA CANAL WITH HOMEWARD BOUND ANZACS, WHO ARE ON THE LAST LEG OF A ROUND-THE-WORLD VOYAGE. FIG. 2—FIRST CONCRETE SHIP LAUNCHED IN THE PACIFIC NORTHWEST TAKING THE WATER AT VANCOUVER, WASH., AND HER LITTLE SPONSOR, MARGARET SCOTT—FIG. 3—DUTCH NAVAL VESSEL SETTING OUT A MINE ANCHOR IN THE NORTH SEA—FIG. 4—UNITED STATES CRUISER MILWAUKEE BREAKING UP ON THE SHORES OF CALIFORNIA—SHE WENT ASHORE LAST YEAR IN A HEAVY STORM—FIG. 5—COAST GUARD CUTTER MANHATTAN, RECENTLY BUILT AND ENTIRELY FITTED OUT AT THE PANAMA CANAL SHOPS—SHE WILL BE USED ALONG THE ALASKAN COAST

Latest Marine News in Pictures



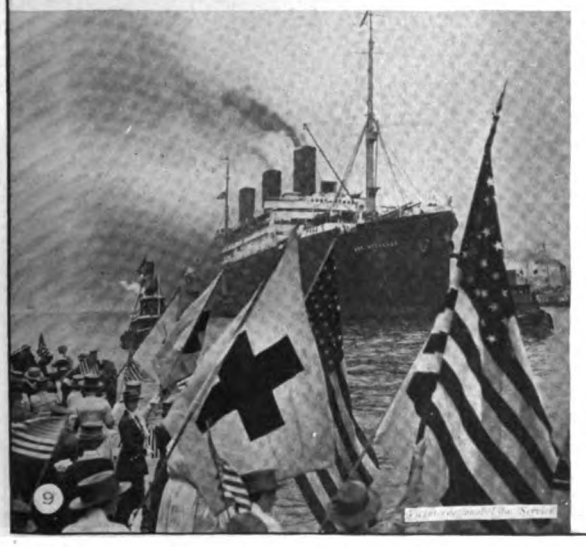


FIG. 6—SANTA ELISA OUTWARD BOUND—SHE WAS BUILT FOR FREIGHT AND PASSENGER SERVICE BUT HAS BEEN USED BY THE NAVY AS A TRANSPORT—FIG. 7—NEWARK BAY SHIPYARD WHERE 52 SHIPS WERE LAUNCHED IN 52 WEEKS—FIG. 8—UNITED STATES TORPEDO BOAT DESTROYER FOX TAKING THE WATER—SHE IS A PRODUCT OF THE NEW YORK SHIPBUILDING CORP.—HER SPONSOR WAS MISS VIRGINIA BLAIR —FIG. 9—U. S. S. IMPERATOR BOUND UP NEW YORK HARBOR ON THE COMPLETION OF HER FIRST VOYAGE FROM FRANCE AFTER BEING TURNED OVER BY THE GERMANS—FIG. 10—WRECK OF THE MARIECHEN, MYSTERIOUSLY WRECKED DURING THE RUSSIAN-JAPANESE WAR, NOW BEING JUNKED AT SEATTLE

Equips Plant to Make Forgings

To Meet War Emergencies, a Forge Plant Formerly Specializing on Railroad Work Enlarges Its Shops to Handle Marine Forgings

TO ENLARGE its plant 19 times in size since 1914 is what the Camden Forge Co., Camden, N. J., did in a successful effort to furnish heavy forgings on a large scale for government needs. Originally, this company specialized on railroad forgings but at the present time it turns out finished forgings for such massive marine units as propeller shafts, rudder stocks, etc. The conditions which prompted the company to take such drastic measures toward expansion are evidenced in the names of the two latest additions to the plant. These are called the Liberty and Victory shops.

The company originally was equipped to manufacture railroad forgings exclusively, its production facilities at the outbreak of the war being housed in a 50 x 100-foot structure with equipment consisting of three steam hammers, ranging in size from 3000 to 6000-pound capacity the necessary lathes for rough-turning the forgings produced under these hammers, and a heat-treating department.

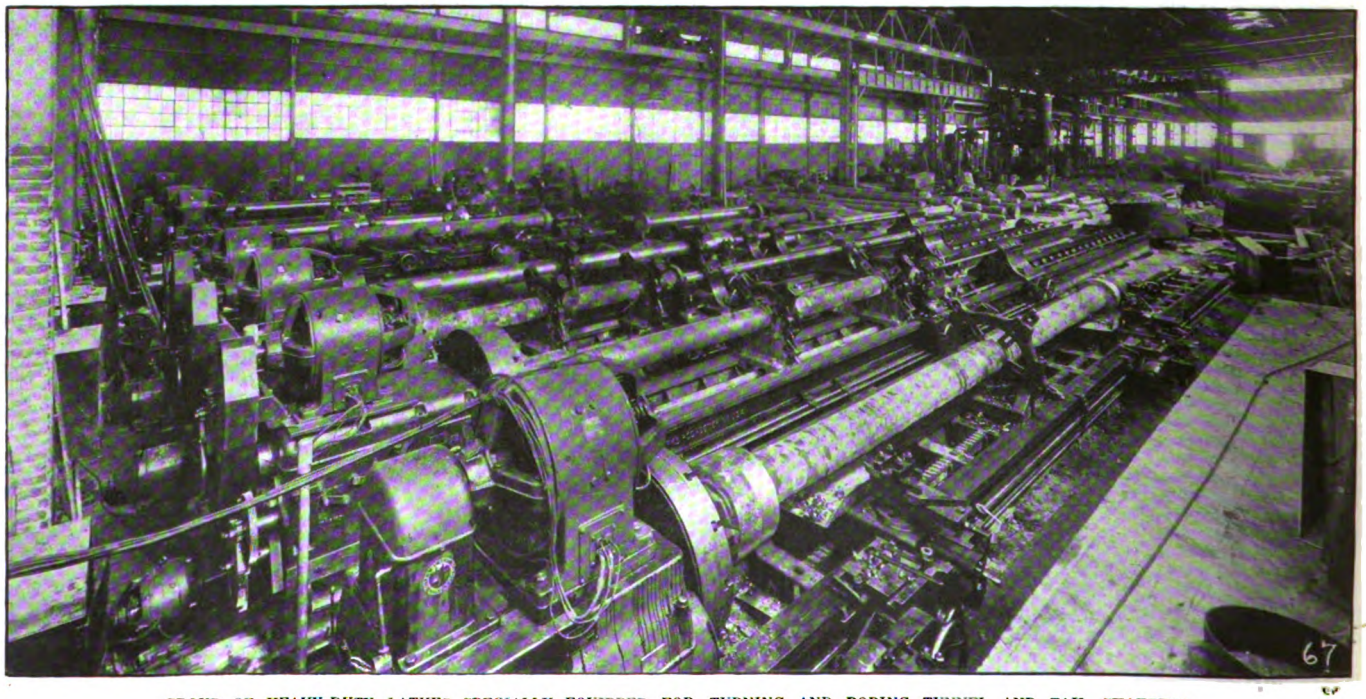
When the war broke out, the company had begun work on the construction of a 75 x 250-foot hammer shop, the principal equipment of which was to consist of four steam hammers of 3 to 5-ton capacity and lathes for rough turning the forgings. At this time, the company was confronted with an expansion problem along one or the other of two lines—it could specialize on ordnance or marine work. Due to the fact that its site was on tidewater, and in the heart of the big Delaware river shipbuilding district, the management decided to turn its efforts to ship forgings.

In April, 1917, when the government was urgently in need of quantity production, the Camden company, of its own accord, added a 75 x 480-foot forge shop which it equipped with two 1200-ton, steam hydraulic forging presses, 16 oil-fired heating furnaces and the necessary machine tools to finish the forgings thus produced. This building is called the Liberty shop. On April 8, 1918, the Victory shop, the company's fourth building, was begun. Work on this structure was carried on with all possible speed so that production was started in this building on May 25.

This building is 75 x 480 feet and in its equipment is included 30 lathes, the largest of which is 72-inch swing with 55-foot center distance, and four planers, the largest of which takes 60 inches square between the housings with a 20-foot cutting stroke. Much of the equipment of the Liberty shop was transferred to the Victory shop when this department was completed. This change allowed more space for the production of forgings. Special equipment of the Victory shop includes six 48-inch lathes for boring and turning forgings. These tools take stock 80 feet between centers and are specially adapted for boring large tail and tunnel shafting.

During the war, and since the signing of the armistice, the company's chief output has been propeller shafting, mostly for torpedo boat destroyers. This is exacting work due to the fact that the engines of these craft turn over comparatively fast. The company was the first to produce propeller shafts for the war destroyer program. The first shafts were finished in January, 1918, and within three months after orders had been placed, production was at a maximum. Beside producing shafting, the company also has made a number of other heavy marine forgings which include engine parts and rudder stocks.

The plant includes a 50 x 100-foot heat treating building which is equipped with both vertical and horizontal oil-fired heating furnaces and vertical quenching tanks. The horizontal furnaces are used for forgings up to 50 feet in length



GROUP OF HEAVY-DUTY LATHES SPECIALLY EQUIPPED FOR TURNING AND BORING TUNNEL AND TAIL SHAFTING

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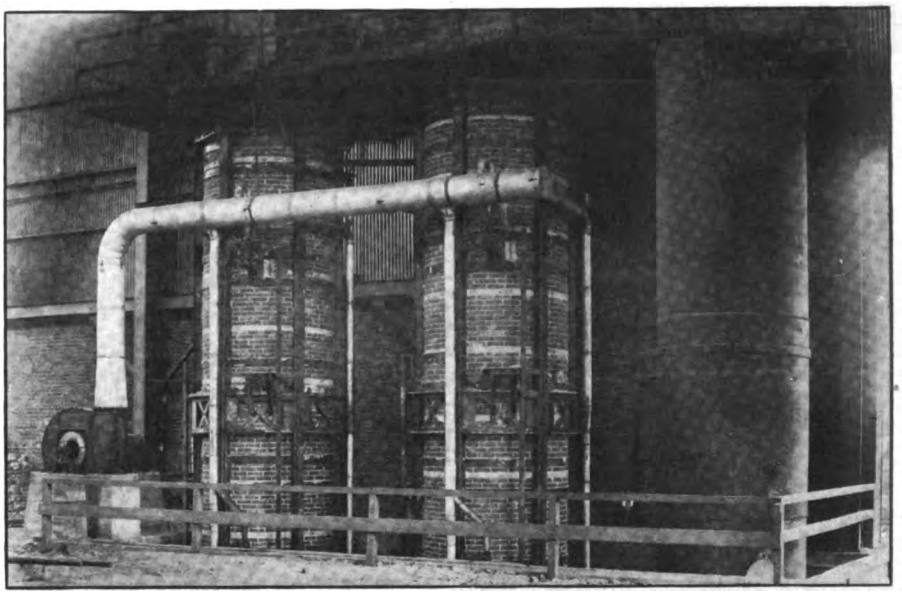
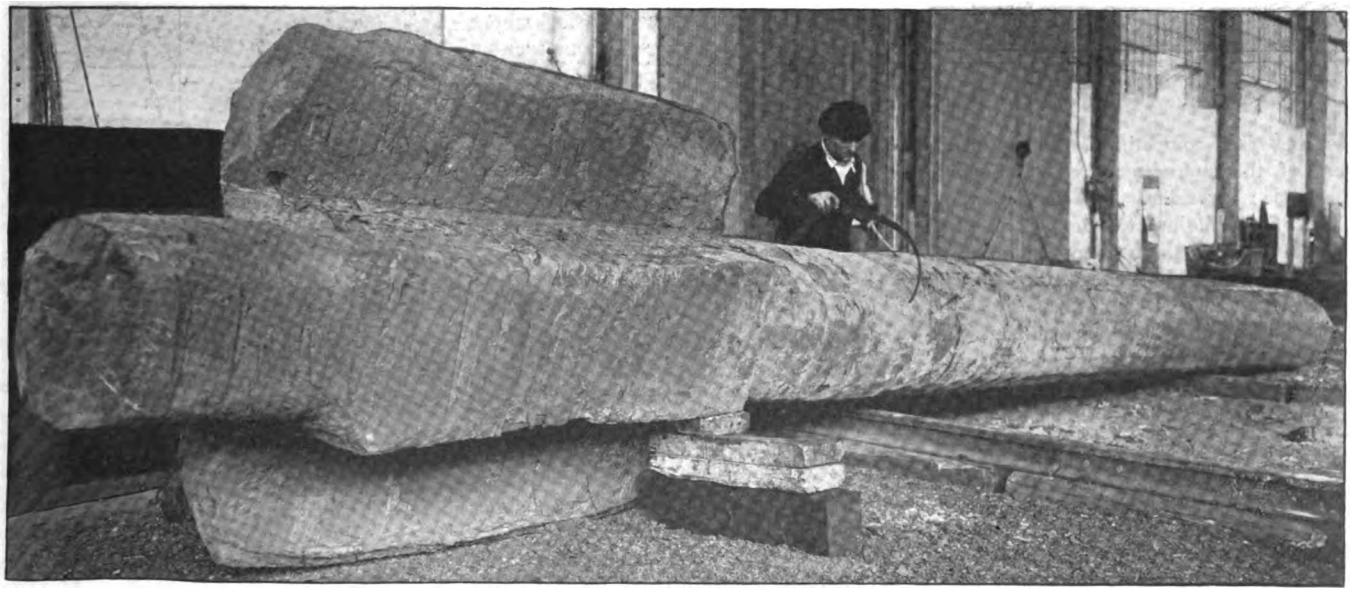
ROUGH-TURNED RUDDER STOCK FORGINGS—THESE UNITS ARE FOR 8000-TON TROOP AND CARGO CARRIERS

while the vertical furnaces accommodate forgings 40 feet long. Due to the fact that the ground is not adapted for the location of quenching tanks below the surface, these are installed above ground. To facilitate the ready handling of these large forgings in a vertical position, a large overhead clearance is provided. This building is served with a 50-ton overhead crane which is installed on a runway 80 feet above the floor level. For testing both raw materials and completed units, the company has equipped a laboratory for physical, chemical and photomicrographic work. The illustrations on these pages graphically show the machine-tool and heat-treating equipment as well as the size of the products that are manufactured. Owing to the exacting nature of this work, skilled mechanics only are employed.



VERTICAL HEAT-TREATING FURNACES AND QUENCHING TANK



RUDDER STOCK FOR 15,000-TON TRANSPORT—THIS UNIT WAS FORGED UNDER A STEAM-HYDRAULIC PRESS

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Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

P. A. S. FRANKLIN, president of the International Mercantile Marine, Inc., has been appointed chairman of a committee to make, through the shipping board, recommendations to congress regarding changes needed in United States navigation laws with particular regard to the measurement of vessels operating under the American flag, revision of rules regarding standardization, construction, inspection and other matters of a technical nature. The object sought is to place American seagoing tonnage on practically the same basis as foreign operated ships, thus

P. A. S. FRANKLIN

assuring fair competition. Other members of the committee are: HOMER L. FERGUSON, president of the Newport News Shipbuilding & Dry Dock Co.; ALFRED G. SMITH, president of the New York & Cuba Mail Steamship Co.; J. P. KIRLIN, H. F. ALEXANDER, president of the Pacific Coast Steamship Co.; CAPT. E. E. O'DONNELL, former supervising inspector of steam vessels at Boston; and DAVID T. WARDEN.

* * *

ALBERT F. HORNE has resigned from the United States shipping board and has accepted a position as auditor with the White Flyer Line Steamship Co., San Francisco. S. GRATTON has taken Mr. Horne's former position with the shipping board and is now stationed at the Moore Shipbuilding Co.

* * *

F. W. GALE, formerly connected with the British ministry of shipping, has been elected president of the Dyson Shipping Co. The company has offices in New York, Chicago, San Francisco and Seattle.

* * *

FRANK J. JEWELL has been elected president and secretary of the Betson Plastic Fire Brick Co., Inc., while NELSON ADAMS has been elected vice president and treasurer. The company has recently been incorporated to manufacture refractory material for boiler furnace linings, baffle walls, etc. The offices and plant are in Rome, N. Y.

* * *

R. J. WYSOR has been appointed assistant general manager of the Sparrows Point, Md., plant of the Bethlehem Steel Co., Bethlehem, Pa. He succeeds M. J. SCAMMELL who recently resigned. Mr. Wyson has been in the employ of the Bethlehem company as superintendent of its B. P. & N. E. railroad.

* * *

W. M. MILLS has been appointed general manager of the Kingston Shipbuilding Corp., Kingston, N. Y. Formerly he was in the employ of the Emergency Fleet corporation, second district, where he had charge of wood ship construction.

* * *

M. V. DREYSPOOL has been appointed general manager of sales for Rownson, Drew & Clydesdale, exporters, New York. Mr. Dreyspool has had a broad experience in traffic affairs. He entered the steel export field in 1915.

* * *

LIEUT. COM. HENRY H. PORTER, U. S. N., has taken charge of the branch hydrographic office in the Bourse, Philadelphia. He succeeds CAPT. ALLAN N. WOOD, U. S. N., retired, who has had charge of the office while the country was at war. Lieutenant Commander Porter formerly was aide to the comcandant at the Philadelphia navy yard and until a few years ago he was radio inspector in the hydrographic office at Philadelphia. During the war, he was stationed at the Virgin islands.

* * *

JOHN E. CUSHING, assistant director of operations, United States shipping board, New York, is in Washington as acting director of operations during the absence of J. H. ROSSETER who at present is enjoying a few weeks vacation. Mr. Cushing is working in conjunction with W. F. TAYLOR, assistant director of operations at Washington.

* * *

R. E. WHEELAN, vice president of the

H. F. ALEXANDER

Potter Transportation Co., has assumed the general management of the Triangle Steamship Co. He is well known to shipping men in both the American continents.

* * *

A. S. FAWCETT was recently appointed purchasing agent of the Pittsburgh Steamship Co., Cleveland, to succeed the late LOUIS HAUSHEER. Mr. Fawcett has been connected with the company for the past 15 years during most of this time serving as private secretary to HARRY COULBY, president of the company. Before entering the employ of the Pittsburgh Steamship Co., Mr. Fawcett was with Pickands, Mather & Co., Cleveland.

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Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

JAMES A. KELLY recently was appointed chief draftsman at the Morse Dry Dock & Repair Co., Brooklyn, N. Y. Mr. Kelly is a shipbuilder of the old school who has spent practically all his life in building ships. He gained his first experience at the Roach yard, Chester, Pa., where he was for 11 years. During this time he had experience in every department of the yard and, under the personal supervision of the late John D. Roach, was given an exceptional opportunity to master the fine points of steel shipbuilding. When the Roach yard closed,

JAMES A. KELLY

Mr. Kelly became connected with the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., where he was employed for 12 years. During the war he was naval architect for the concrete division, United States shipping board. Later he served in the same capacity for the La Salle Engineering Co., Chicago. Just previous to joining the Morse organization Mr. Kelly was engaged in consulting work in New York.

* * *

JOHN A. MCGREGOR, Pacific coast representative of the Bethlehem Shipbuilding Corp. and formerly president of the Union Iron Works, has severed his connection with the company and will remain in the Orient as an employe of the United States shipping board. He is at present in Yokohama, Japan, where he is supervising the construction of 32 vessels for the United States government. Mr. McGregor left San Francisco, Jan. 4, following the granting of the ship contracts to the Japanese and is expected to remain until the end of the year.

* * *

A. R. CANFIELD has been appointed steamship agent for the Port Aransas Harbor Terminal railroad. Recently he was connected with the Leyland line agency in Galveston, Tex.

* * *

ROBERT DOLLAR, president of the Dollar Steamship Co., is in Sydney, Australia, for the purpose of inaugurating steamship service between this country and the Orient by way of the Panama canal. Mr. Dollar figures on a large export business of steel and coal to India and other Far East points.

* * *

JOHN H. O'DOWD has been appointed Pacific coast agent for the United Fruit Co. Mr. O'Dowd will be stationed in the company's recently opened freight and passenger office in San Francisco.

* * *

LIEUT. COL. JOHN QUINN of Boston has been appointed district agent of the shipping board with headquarters at Boston, succeeding Capt. A. L. Crowley, who tendered his resignation last January to return to private business. Colonel Quinn will have charge of American vessels between Nova Scotia and the Connecticut river. He recently returned from Bordeaux where he superintended unloading of supplies for the army.

* * *

G. A. REINHART has been appointed manager of the International Mercantile Marine Co.'s new office at Norfolk, Va. Formerly he was located in the company's New York office. Continued expansion of the company's steamship service made necessary the opening of the Norfolk office. The first steamer to sail from the Virginia port under the company's operation was the WESTERN SEA. She sailed for Liverpool with a full cargo of cotton and other goods.

* * *

WILLIAM C. METZ, who formerly was connected with the International Freight Contracting Co., New York, is now general manager of August Reed & Co., also of New York.

* * *

CARL L. BREHM has resumed his duties as manager of the Delaware River Discharging Co., Camden, N. J. He recently returned from service overseas with the Twenty-fifth regiment of engineers.

* * *

PRENTISS N. GRAY, president of P. N. Gray & Co., Inc., New York, who formerly had charge of transportation for

HENRY M. ROBINSON

Recently appointed member of the United States shipping board who succeeds Charles N. Page, resigned

the commission of relief in Belgium, is now in Brussels on business for the Belgian government.

* * *

MARCELINO GARCIA has entered the steamship agency firm of Manuel Diaz, New York. In the future the company's business will be conducted under the name of Garcia & Diaz. For the past 16 years, Mr. Garcia was connected with G. Amsinck & Co., importers and exporters, New York.

* * *

EVERETT M. PRICE, Bellport, N. Y., has been appointed warden of the port of New York.

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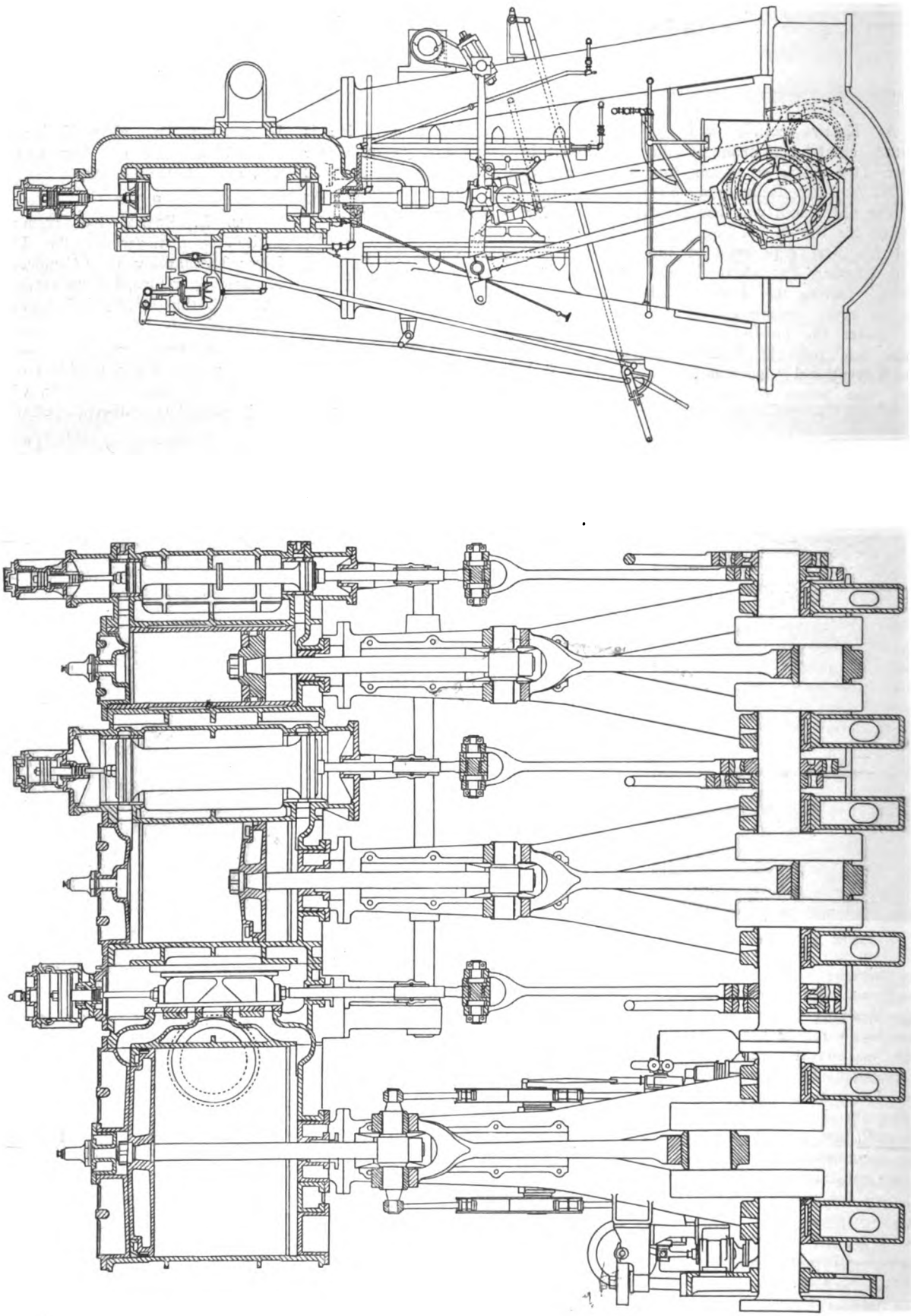

FIG. 21—LONGITUDINAL SECTION AND END ELEVATION OF THE 2800-HORSEPOWER ENGINES BUILT FOR THE EMERGENCY FLEET CORPORATION BY THE HOOVEN, OWENS, RENTSCHLER CO., HAMILTON, O.

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Building Marine Engines on a Quantity Basis

By F. B. Jacobs

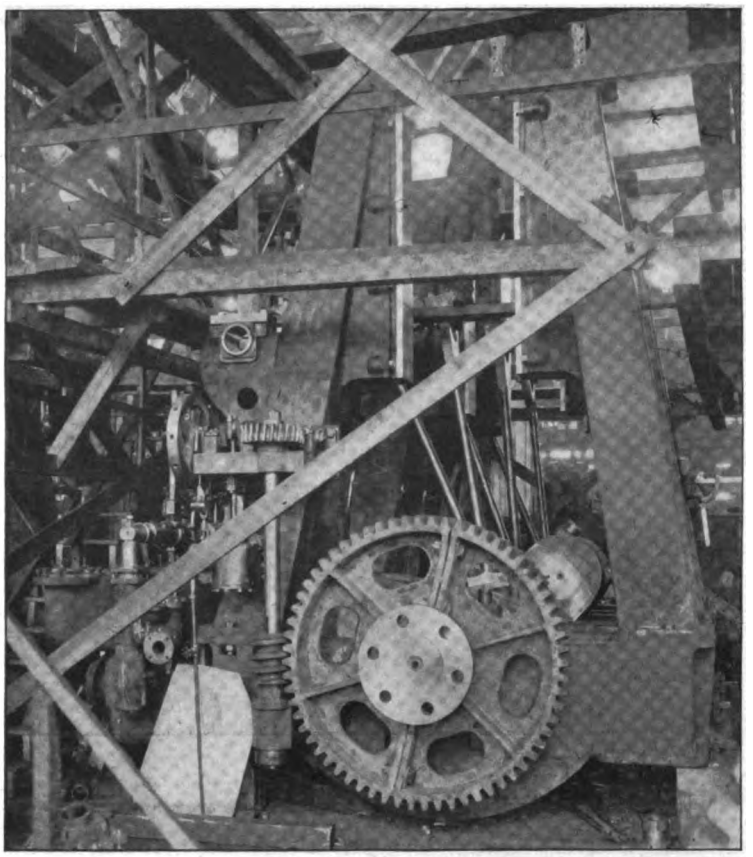

Fig. 22—Partially Assembled Engine—The Crankshaft, Columns, Part of the Valve Gear and the High-Pressure Cylinder Are in Place

ON the correct assembly of a marine engine depends its smooth running. If the parts are carelessly fitted and poorly aligned, the engine is bound to develop trouble from time to time, due to undue heating of various bearing surfaces. If either an eccentric, main bearing, crosshead slipper or crank pin brass, for illustration, should suddenly run hot while the vessel is running through a heavy sea, disaster might result if it were necessary to heave the vessel to. Proper alignment of the various wearing surfaces, which constitutes 75 per cent of assembly operations, is absolutely necessary.

Skilled mechanics of long training are required in the assembly of a marine engine as the handling of the heavy units involves a degree of skill that cannot be mastered easily. At the plant of Hooven, Owens, Rentschler Co., Hamilton, O., the men intrusted with such work are skilled mechanics who have been specially trained to assemble heavy machinery.

The company's assembly department is located in a side bay off the main machine shop. Two 50-ton traveling cranes are used for handling readily the heavy units involved. Each engine is assembled in a crib, several of which are shown in Fig. 23. These cribs are substantially built of heavy timbers and are provided with amply wide working stages and stairways so that the mechanics can reach all parts of the engine easily. Hand rails are provided as a means of safety. The cribs are permanent and as soon as one engine is completely assembled and removed operations on another are immediately begun.

The first step in assembly is to set the bed in a level position at the bottom of the crib. It is supported on a number of box-section, cast iron blocks and laid perfectly level by means of shim wedges that are driven between the lower surface of the bed and the upper surfaces of the blocks. On this operation depends primarily the success of the entire assembly as it is imperative that the bed set perfectly level. This is accomplished by means of accurate engineer's levels and straight edges.

After the bed is correctly leveled, the lower halves of the main bearings are set in place. Then the assembled crankshaft which consists of two units bolted together by a coupling, is lowered in place. This shaft also carries a cast-iron worm wheel which is actuated by the turning gear. The engine that operates the turning gear is installed on the after port columns. This unit in the assembly operation saves time in turning the shaft over while spotting the bearings for scraping them to a good running fit. The columns are next lowered in place by a traveling crane, and the turning engine installed and correctly aligned.

Marine Engine Assembly Requires Skill

CORRECT assembly and proper fitting of parts controls the success of any marine engine. Poorly fitted and improperly aligned parts lead to disaster sooner or later. As a matter of fact, engine failures at sea can generally be traced to poor assembly and fitting.

At the works of the Hooven, Owens, Rentschler Co., Hamilton, O., great care is exercised to see that the engines are correctly assembled and properly tested before they are dismantled for shipment to tidewater or to the Great Lakes, where they are installed.

This is the third and last installment describing marine engine building operations at the Hamilton plant. The first installment, which appeared in the June issue, described manufacturing operations on comparatively heavy units while the second installment, in the July issue, was devoted to lighter parts. The present installment describes assembly operations.

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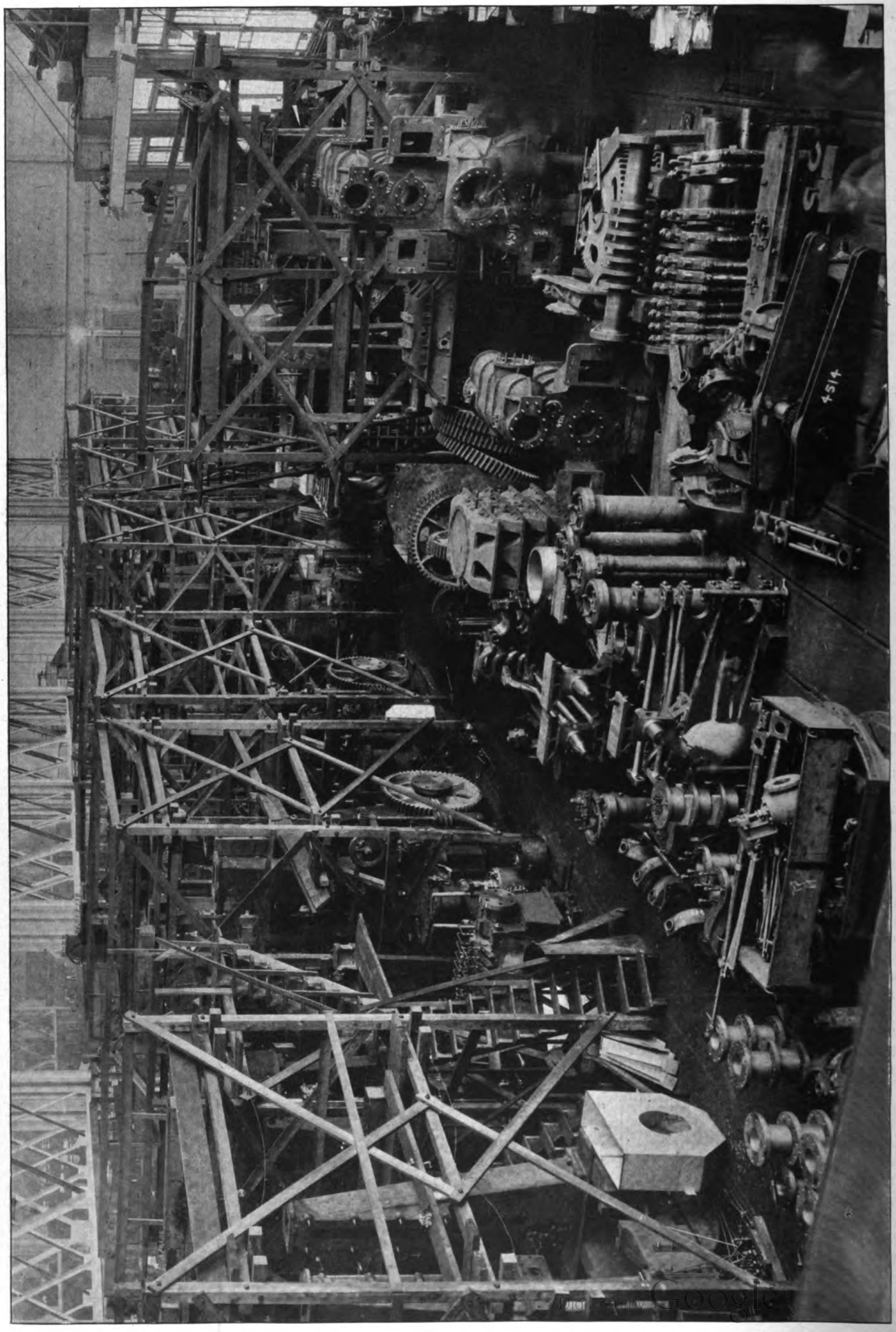

FIG. 23—ASSEMBLY FLOOR AT THE HOOVEN, OWENS, RENTSCHLER CO.'S PLANT AT HAMILTON, O.—THE ENGINES ARE ASSEMBLED INSIDE OF PERMANENT CRIBS—THIS DEPARTMENT IS SERVED BY TWO 50-TON TRAVELING CRANES

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All six columns are carefully located in place and correctly aligned. It is necessary for the surfaces to which the crosshead guides are bolted to stand parallel with the crankshaft, perfectly plumb and eqidistant from the center line of the crankshaft. They are set plumb by means of a level while a template is utilized to make sure that the holes for bolting the cylinders in place are the correct distance apart. After the columns are in place, the turning gear is assembled and the operation of scraping the lower crankshaft bearings begun. A quantity of red lead is rubbed on the shaft journal after which the shaft is rotated a few revolutions by means of the turning gear engine which in this operation is operated by compressed air. Then the shaft is raised out of its bearings and the high spots on the bearings scraped away by hand. This operation is continued until all the lower sections of the main bearings show good bearing surfaces. This operation cannot be carried out hurredly because it is essential for each bearing to make close contact with the shaft. If it should bear in a few spots only, undue friction would be sure to develop at these points later. Next, the bearing caps are scraped to a fit. They are loosely positioned so that they bear on the shaft by their own weight, the shaft turned over as before and the high spots scraped away. Before being bolted in place, several sheetmetal liners are interposed between the two bearing sections. The object of these is to insure the bolts holding the two sections of the bearing together tightly with just enough clearance between the shaft and the bearings to insure a good running fit. In reality, the shaft does not actually fit its journals by several thousands of an inch as this space is necessary for the film of oil that lubricates the shaft. A number of thin liners instead of a few thick ones are used because in subsequent operations, wherein it is necessary to scrape in new bearings, just the proper amount to interpose between the two bearing sections can be allowed by adding or removing these thin liners. They vary in size from three to 10 thousands of an inch and are made of sheet metal, finished perfectly flat.

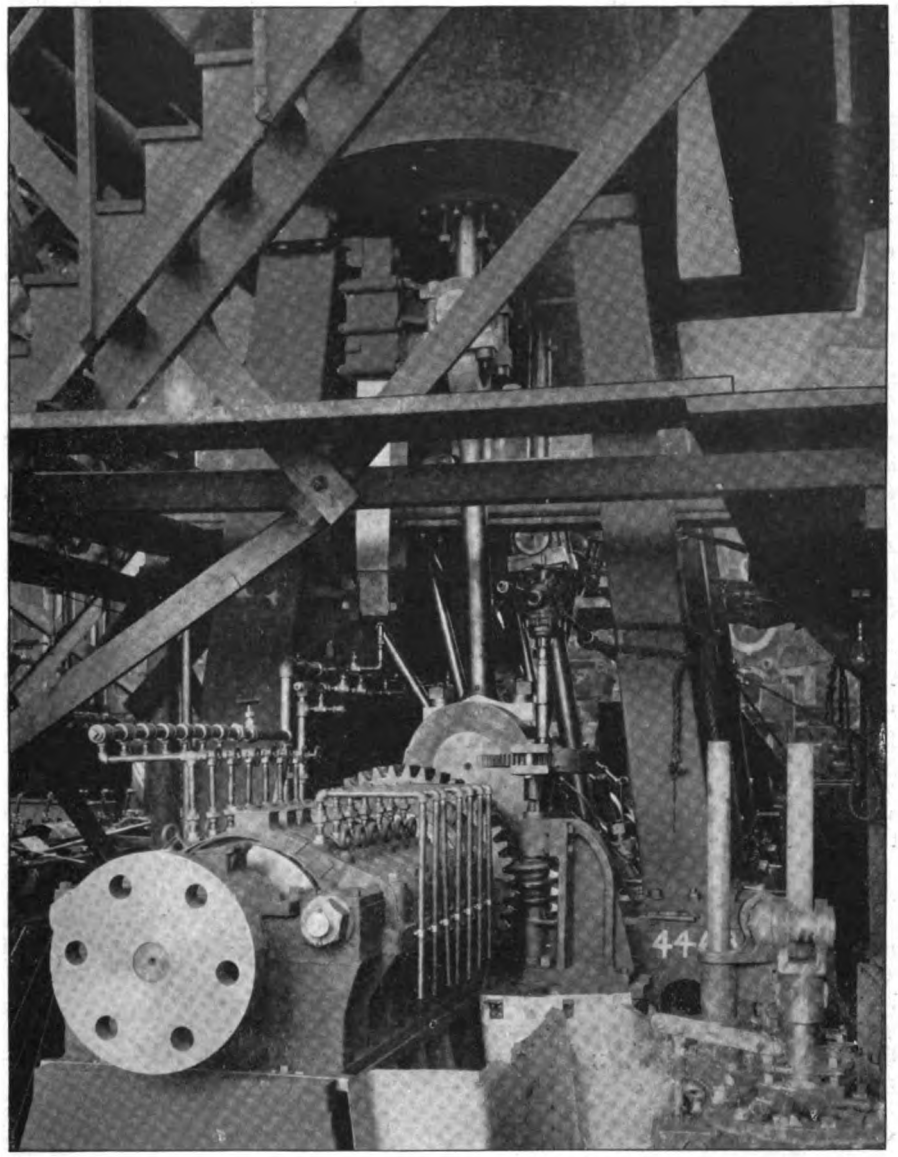

FIG. 24—1400-HORSEPOWER ENGINE PARTIALLY ASSEMBLED—THIS TYPE OF ENGINE IS USED IN WOODEN VESSELS BUILT FOR THE EMERGENCY FLEET CORPORATION

At any time after the crankshaft is in place the crankpin boxes can be fitted. These are scraped to a bearing and provided with liners between the two halves to compensate for wear and adjustment after rescraping. Sometimes, however, these bearings are fitted before the crankshaft is installed in place on the engine.

The eccentrics of any marine engine require close fitting as they are made in halves. Otherwise, it would be impossible to get them located on the crankshaft. The two halves are held together by means of bolts. As the eccentrics on the engine under consideration have no hubs, the bolts must pass directly through the eccentric sheave, or pulley as it is sometimes termed. When the bolts are set up tight, the eccentric must hug the shaft firmly. If it does not, all the strain of actuating the valve gear comes on the eccentric key. Again, if the ececntric is not properly positioned on the shaft it is thrown out of round which makes a poor bearing surface. The eccentric straps are lined with bearing metal. The straps must fit the eccentrics nicely to insure a good running fit. If they are too loose, the valve gear pounds in operation and if they are too tight they will heat up and stick, sometimes carrying away the whole valve gear. After the eccentrics are fitted on the shaft, the straps are generally put in place and the rest of the valve gear built up. This consists of bolting the eccentric rods to the eccentrics, hanging the links, installing the reverse shaft, links, link hangers, etc.

The cylinders, as before stated, are made in three units, bolted together. The high pressure cylinder is first lowered in place and bolted to its columns. It is necessary to see that it stands perfectly square with the crankshaft for if its bore is out of line, and undue strain is thrown on the packing gland, crosshead and connecting rod bearings.

Next the intermediate cylinder is

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placed in position and last of all the low pressure cylinder. All cylinders are bolted together and securely fastened to their columns.

The assembly is now about half completed. With the cylinders in position and correctly aligned, the columns are firmly tied in place in which condition the heavy connecting rods and crossheads can be assembled without throwing an undue strain on the columns. This might happen if they were placed in position before the cylinders were installed. As a matter of fact, it would be much easier to assemble the connecting rods and crossheads before the cylinders were positioned because they could readily be lowered in place through the gap between the tops of the columns. Safety however, requires that the cylinders be put in place first.

The connecting rods are first bolted in place on the crankpin boxes. The upper end of the connecting rods are forked to span the crosshead. These units are now assembled. First, the wrist pin is placed in position and the slippers installed approximately the correct distance from the center line. Then the crossheads are placed in their working position between the crosshead guides and carefully aligned in relation to the cylinders. It is obvious that the crossheads must be centrally located, that is, the hole to receive the lower end of the piston must align correctly with the bore of the cylinder, both fore and aft and sidewise. If this is not done properly, an undue strain is thrown on the finished engine that would ultimately cause heating.

The pistons, to which the piston rods have already been fitted, are lowered in place and the piston rods fitted to the crossheads. The engine can now be turned over slowly and the crosshead slippers adjusted to bear properly on their guides. The guides for the valve rods are fitted in place next after which the valves are lowered in position and connected up with the valve gear.

Getting Cylinder Clearances

Correct clearances at the top and bottom of the cylinders are imperative and they are marked plainly for the guidance of the engineer in subsequent overhauling operations. If the clearances are not correctly determined and plainly marked, this inattention might result in a cylinder head being knocked out while at sea. This is one of the most serious accidents that can happen to a marine engine and for this reason, ample provision is made to guard against it.

The lineal clearances on the engine being built at Hamilton are 3/8-inch at the top and 5/8-inch at the bottom of all cylinders. Both the clearance and striking points are plainly marked on the crosshead guides. In the assembly operation, several liners are interposed between the lower end of the connecting rod and the crankpin bearings. Thus, these liners can be adjusted to give the necessary clearance.

The reversing engine is now installed in place. This unit is a single-cylinder engine, equipped with a slide valve and bolted to the medium-pressure, back column. It has floating links and levers and is controlled from the handling station at the front of the engine.

Now that the valve gear and reverse engine are in position, the valves can be set. This is one of the most important of the assembling operations, due to the fact that the eccentrics are permanently keyed in place. Thus, if the gear is not properly set, it is impossible to change it without resorting to offset keys which are slipshod appliances at best.

How the Valve Gear is Set

In setting the valve gear, the eccentrics are first positioned in the approximate positions to give the desired annular advance. This is determined by the assembler's eye. Thus the go-ahead eccentric of each separate valve gear is set approximately 90 degrees ahead of its crank, plus lap plus lead. Due to the accepted marine engine practice, the bottom ports are given more lead than those at the top. The leads on this engine are: High pressure, top, 15/32 inch; high pressure, bottom, 19/32 inch; intermediate, top, 9/16 inch; intermediate, bottom, 5/8 inch; low pressure, top, 11/16 inch; low pressure, bottom, 7/8-inch. The high pressure cylinder valve is of the inside admission type while the intermediate and low pressure valves are arranged for outside admission. Piston valves are employed on the high pressure and intermediate cylinders while the low pressure cylinder is equipped with a double-ported semi-balanced slide valve. Due to their design, the high pressure and intermediate valve are, of course, fully balanced.

With the valve gear thrown in full go-ahead position, the go-ahead eccentric is set to give the approximate lead. Then the gear is thrown in full gear astern and the backing eccentric approximately set. Now the assembler has a definite point to start from. Next the engine is set exactly on its center. This is accomplished by making a mark on the crosshead guide when the connecting rod is a few degrees away from its highest center point. At this juncture a mark is made on one of the coupling flanges and a pointer set to align with this mark. Then the engine is set off center in the other direction until the crosshead coincides with the mark previously made on the crosshead guide, and another mark made on the coupling flange. By dividing the distance between these two marks on the coupling flange scribing a center mark and setting the shaft in position so that this center mark is in alignment with the pointer, it is obvious that the engine is exactly on center.

It is important that this operation be carried out carefully due to the fact that the angularity of the main rod is at its least point of effectiveness while that of the eccentric rod is at its greatest. Thus a slight error in setting the engine on its center would result in a faultily adjusted valve gear.

Now with the engine exactly on center, the valve is given the correct lead by advancing or retarding the eccentric. Then the engine is set on its lower center and the valve lead measured. If these coincide with the leads above given, all well and good. If they do not, however, the difficulty is remedied by shimming between the eccentric straps and their eccentrics by means of liners. As a rule, all marine engines carry liners at these points to facilitate valve setting. This applies to the high and intermediate pressure valves only. Due to the fact that the low pressure valve is provided with an adjustment on its stem, as shown in Fig. 21, it can be adjusted to give the correct travel without shimming the eccentric rods.

Setting the Reverse Eccentrics

The next step is to set the reverse eccentrics. In this operation, the crank is placed successively on the top and bottom centers and the leads measured. If the leads for the backing motion agree with those for the forward motion, the eccentric has the correct annular advance. The astern eccentric is shifted until these leads agree. Now with the backing eccentric in its proper position the engine is carefully placed on the top center and the top lead measured. If this lead is the same as that given by the go-ahead eccentric, all is well, but if it is found to be less, the astern eccentric rod must be shortened by taking out some liners between it and its eccentric strap to give the correct lead. Conversely if the lead is longer,

(Concluded on Page 397)

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Practical Ideas for the Engineer

Creosoting Ships' Timbers—Tests on Watertube Boiler—Hatch Cover—River Launch—Repeating Ships' Log—Industrial Signals—Quick Repairs on Ship's Stern

A SIMPLE labor saving device for heating creosote or other wood preservatives so they may be applied hot is being used at a Louisiana shipyard, and would be of value wherever the brush method is used, according to William W. Morris, formerly industrial examiner in forest products for the United States forest service at its laboratory in Madison, Wis. An advantage of the device is the reduction of fire risk. A box about 2 feet wide and 10 feet long is made watertight by calking. It is filled with water, which is heated to the boiling point by steam from a pipe at one end. Round holes are cut in the top of the box, each the right size to receive a cone-shaped bucket. The lower part of the bucket sinks into the water, the top rim fitting the hole so that the bucket is held in place. The wood preservative is placed in the buckets which, when set in the holes of the box, are immersed in the boiling water. The preservative soon heats to approximately the boiling point of the water, and is taken in the buckets directly to the ships to be applied on the timbers.

Before this method of heating was in use it was necessary to employ four men in different parts of the yard, at wages of 40 cents an hour, to heat the preservative. Each man applying the preservative on returning to the box simply refills his empty bucket, places it in the hot water, and takes one filled with hot preservative. Thus, while the men are applying the preservative on the ship timbers an additional supply is being heated. By this means about $17 a day is saved and the preservative kept at a high temperature with no risk of fire. When not in use, the buckets are kept covered. The application of wood preservative at the yards is thorough. A pine-tar product is used, applied hot, and in general only one treatment is given. The following timbers are given preservative treatment:

1. All parts of all frame timbers.
2. All ends and tops of all upper deck beams and points of contact of shelves and waterways.
3. The bottom of the upper decking. In using creosote here, there is some danger of the odor penetrating the cargo. Moreover, it would be difficult to paint over this portion in case this were necessary.
4. The frame side and edges of the ceiling, and frame side of the planking. The edges of planking would also have been creosoted if it were not for the presumption that creosote deteriorates oakum.
5. All points of contact on frame timbers, bulkheads, and all parts of the deadwoods.
6. All treenails. Creosote is considered better than grease for treenails, as they hold in place better when creosote is applied.
7. The holds including the stanchions were originally all treated. This treatment is to be done away with on account of the effect of the odor of the creosote on the cargo.

Change Inspection Rule

With the object of reducing inspections on chain and cables, the Emergency Fleet corporation has made a recent ruling under which it is necessary to inspect chain but once. As an illustration, formerly these products during manufacture were often inspected both by the American bureau of shipping and by Lloyds. At the present time, however, if a vessel is registered by Lloyds and her chains and cables are passed by the American bureau of shipping, or vice versa, this certification will be accepted.

Tests Watertube Boiler

The boiler shown in the accompanying illustration is the type used by the Emergency Fleet corporation for installation in its wooden ships. This particular boiler was recently built by the Erie City Iron Works, Erie, Pa., after which it was subjected to exhaustive tests under the supervision of F. W. Dean, senior engineer for the Fleet corporation. This boiler has a heating surface of 2518 square feet and is designed for a working pressure of 200 pounds to the square inch. It is equipped with 408 tubes, 3 inches in diameter, and has 77.5 square feet of grate surface. It is of the cross-drum type, the drum being 42 inches in diameter and 9 feet 3 inches long.

The government has conducted a series of elaborate tests on these boilers during the past year in an effort to find out under what conditions the highest efficiency is obtainable. While the full results of the tests are not available at present, a number of interesting conclusions have been determined. As first tested, the experimental boiler built at Erie showed an efficiency of 66 per cent but after 25 tests, this was increased to 74 per cent. In these tests, the boiler was fired by hand.

WATERTUBE BOILER RATED AT 250 HORSEPOWER NOW BEING TESTED FOR THE GOVERNMENT AT ERIE, PA.

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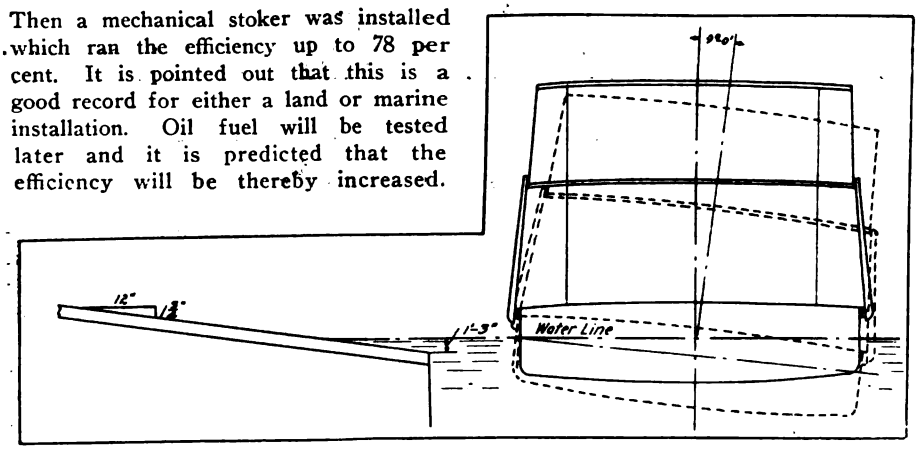
Then a mechanical stoker was installed which ran the efficiency up to 78 per cent. It is pointed out that this is a good record for either a land or marine installation. Oil fuel will be tested later and it is predicted that the efficiency will be thereby increased.



HOW A STERN WHEEL RIVER TOWBOAT BEHAVED DURING LAUNCHING—THE FULL LINES INDICATE THE POSITION AFTER LAUNCHING WHILE THE DOTTED LINES SHOW THE EXTREME POSITION WHILE THE CRAFT WAS TAKING THE WATER

The boiler is rated at 250-horsepower. Its coal consumption, normally, is about 1400 pounds per hour but by using forced draft as high as 3000 pounds per hour have been consumed. The coal used is said to be the best grade obtainable in this country and comes from Maryland. Evaporation tests of the steam generated showed that as high as 12 tons of water an hour have been used. This is approximately eight tons of water to one ton of coal.

Improved Hatch Cover

Hatch covers designed for use on cargo vessels, whether intended for inland lake or deep water service, should be watertight and proportioned to resist the impact of heavy seas during rough weather. Ease of manipulation in opening or closing the hatch is another factor that appeals to the vessel man. With the object of supplying a hatch cover that will meet these requirements, Harry S. Moore, Algonac, Mich., recently developed and patented the device shown in the accompanying illustration.

The upper illustration is a perspective view of the hatch cover as it is installed on the hatch coaming. In this illustration the channel bar in the foreground is removed to illustrate the mechanism. The lower view is a longitudinal section. The upper view shows the hatch closed while the lower illustration shows it open. In the illustrations *A* is the ship's deck, *B* the hatchway, and *C, D, E* the coaming.

Two sets of cover plates are shown at *H* and *J*. These are steel plate and are constructed to overlap each other when the hatch is closed. When the hatch is open, they arrange themselves in piles at either side. With the object of providing sufficient strength in construction, the plates are provided with stiffeners, *K*, at one side. The upper part of the stiffeners, *L*, forms a coupling flange which permits one plate to actuate the following member when the hatch is closed. This flange engages the following plate by means of the bent portion, *M*. The outermost plate of each side unit, *J*, is equipped with a flange, *N*, which hooks over the side of the coaming at *F*. With the object of forming a watertight joint at this juncture, packing, *O*, is placed at the inside of the flange, *N*. This packing is rubber.

When the hatch covers are in place, they are locked by means of the cover plate, *P*. The upper side portion of the coaming is provided with a bead, *G*, over which a channel-shaped section, *R*, is fitted. The object of this member is to provide a watertight joint. For holding the hatch securely in place after it is closed, clamps, *Q*, are provided. One end of these is equipped with a hook while the other end is provided with a set screw.

When the hatch is open, the plates are stowed at each side on the supports, *S*. The cover is operated by a tackle, *T*, provided at one end with a loop, *U*, which is passed over the pins, *V*. The tackle runs over the pulley, *W*, which is mounted on a standard, *X*.

It is pointed out that the hatch cover does not require covering with a tarpaulin after it is closed, thus effecting a material saving. It is claimed that the cover is easily manipulated and that it makes the hatch watertight.

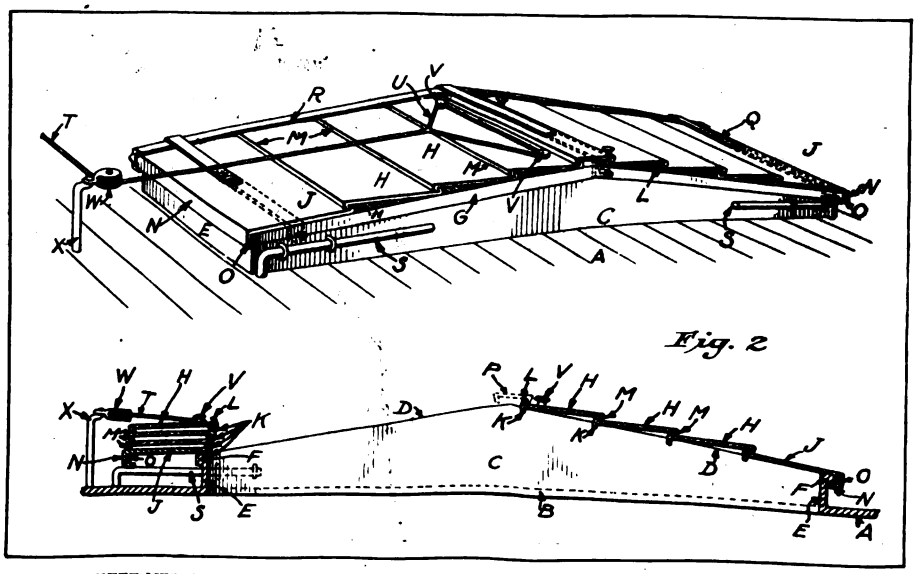


Fig. 2

SHEET-METAL HATCH COVER MADE IN SECTIONS TO PERMIT EASY MANIPULATION

Launches Boat Complete

River shipyards are nearly always confronted with peculiar launching problems, the details of which must be worked out with mathematical precision to insure satisfactory results. Many of the factors involved are shown in the sidewise launching of the stern-wheel river towboat WARREN ELSEY, recently built at Neville Island, Pa., by the engineering works department of the Dravo Contracting Co., Pittsburgh.

The launching was unique in Ohio river side launching in that the boat was practically complete. All equipment including engines, boilers, piping, stern wheel, auxiliaries and upper cabin were installed while the boat was on the ways. The hull, boiler deck and pilot house are steel, while the crew quarters on the upper deck are wood.

On account of the height and weight of superstructure and machinery above the deck, careful observations were made to determine the behavior of the boat during launching. These included the maximum list, list on recovery, maximum depth of water taken, angularly of longitudinal axis of boat to ways when taking the water, speed of boat when leaving ways and hogging or sagging of boat after flotation. The accompanying cross-section illustrates in part the behavior of the boat during launching.

Four pairs of launching sleds were used. These were equally spaced. They were placed under the boat athwartships and level longitudinally. The launch

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ways had a slope of 1¾ inches to the foot and were supported permanently on concrete piers, except for the outer ends which were on piling.

The height of the boat above the water when leaving the ways was 3½ feet. The speed of the boat at launching was 16 feet per second. The time of launching from cutting the lines until taking water was 11 seconds.

The maximum list of the boat was 9 degrees. This was determined by a glass U-tube, with vertical legs spaced 3 feet, half filled with thin paint, located in a fixed position on the upper deck. A pendulum indicator consisting of a 10-pound mass mounted on a stiff-bar radius arm 24 inches long was also used. This was entirely unsatisfactory. Its results would probably have been better had the radius arm been much shorter. On recovery the boat listed 5 degrees in the other direction.

The boat dipped 18 inches lower on the stern when taking the water than was the draft afterward at this point. This was noted by two observers located on shore with levels, readings being taken on the stern flagstaff which was graduated.

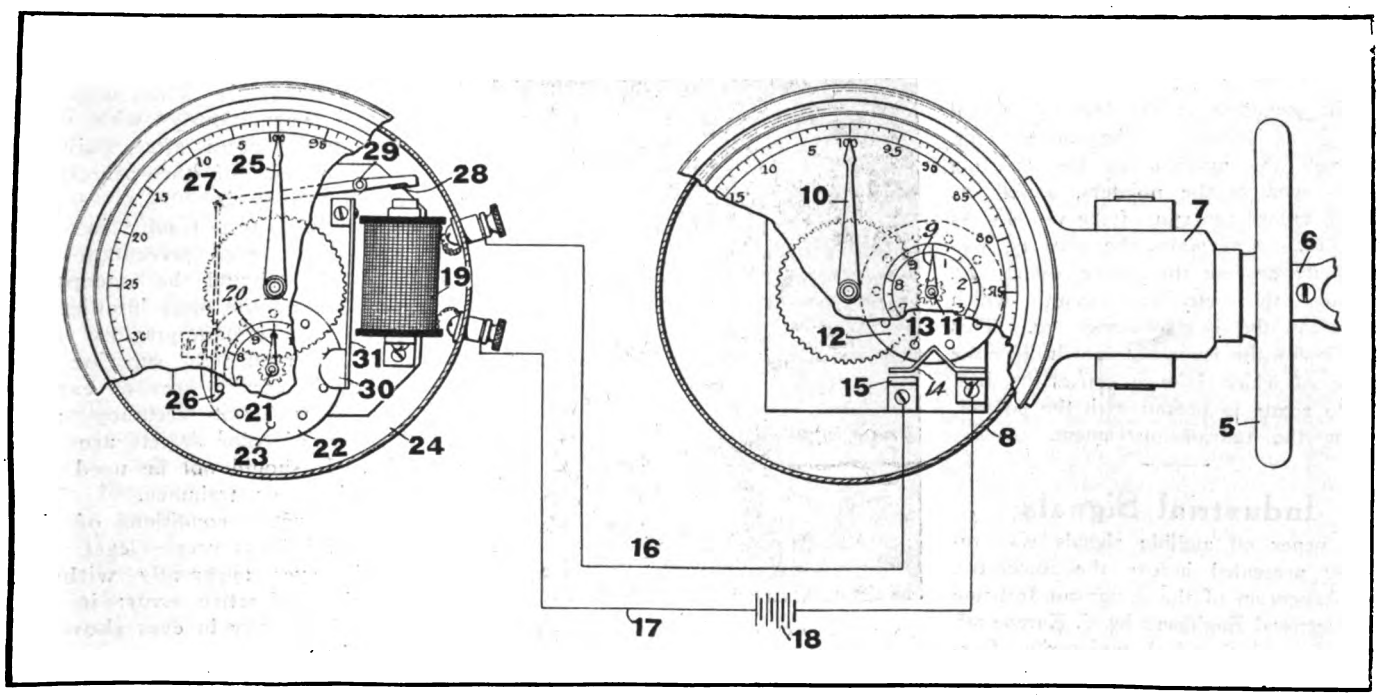
The boat left the ways squarely. Two observers, sighting past range poles located at the water's edge, only estimated a 6-inch variation for the length of the boat. The weight of the boat when launched was 367 tons, figuring its displacement. The draft at the stern was 4 feet 3⅜ inches, and at the bow, 2 feet 8¾ inches. The stern launching sled carried a weight of 111 tons, having a pressure of 4.1 tons per square foot on the ways.

After flotation, the boat showed practically no hog or sag. The readings taken at quarter points showed defection of one sixteenth of an inch.

Dimensions of the boat and sizes of main equipment are: Overall length 162 feet, hull length 137 feet 5 inches, beam 27 feet, depth 6½ feet.

The engines are of the tandem compound type placed fore and aft on the after deck, cranked directly at 90 degrees to the stern-wheel shaft. The cylinders are 14 x 30 inches bore with 6-foot stroke. The stern wheel is 20 feet in diameter and 18½ feet long.

Steam at 200 pounds pressure to the square inch is generated in three boilers 40 inches diameter x 28 feet long, located fore and aft on the forward deck. The boat was built for the Vesta Coal Co. and will be used by that company in towing coal for the Jones & Laughlin Steel Co. She is now in commission.



REPEATING SHIP'S LOG TO ENABLE THE NAVIGATOR TO NOTE THE VESSEL'S RUN AT ANY TIME FROM THE BRIDGE

Repeating Ships' Log

Many years ago, when the taffrail log was first introduced to replace the cumbersome hand-heaved ship's log, it met with instant favor due to the fact that it served as an accurate and readily consulted means for noting the ship's speed at any time. To enable the navigating officer instantly to note the vessel's speed without leaving the bridge, Charles P. Maxson, West Mystic, Conn., recently devised and patented a repeating form of log which embodies an electric principle. Mr. Maxson's log is shown in the accompanying illustrations.

The unit at the right is the taffrail member as viewed from the port side while at the left is shown the repeating unit which is mounted in any convenient place on the bridge or in the wheelhouse. The taffrail instrument is provided with a flywheel, *5*, which is firmly fastened to the shaft, *6*. At the outer end of the shaft is the usual shackle to which is bent the log line carrying at its further end the whirling drag, as in ordinary practice.

The housing in which the shaft journal is located is shown at *7*, while *8* is the case that confines the working mechanism consisting of a gear train actuated by the driving shaft, *6*, which revolves the pointers, *9* and *10*. By this means, the whirling drag registers knots through the medium of the large pointer, *10*, while the small pointer, *9* registers divisions of one knot in tenths.

The shaft *11*, on which the pointer, *9*, is installed, also carries a disk, *12*, which is provided with pin, *13*. These are equally spaced to correspond to the divisions over which the pointer, *9*, travels. As the disk, *12*, revolves, the pins, *13*, deflect the electric spring switch, *14*, which causes it to make connection with the terminal block, *15*. The switch terminal and block are part of an electrical circuit of which *16* and *17* are the lead wires, *18* the battery, or other electrical source, while in the recording instrument, *19* is an electromagnet.

This magnet is energized every time the switch, *14*, makes connection with the terminal block, *15*. This action coincides with the movement of the pointer, *9*, and is for the purpose of moving the pointer, *20*, on the repeating instrument. In general principle, the repeating instrument resembles the taffrail unit as the pointer, *20*, shaft, *21*,

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disk, *22*, and pins, *23*, are practically duplicates of like parts in the taffrail unit.

The repeating unit is contained in a case, *24*, and is provided with a pointer, *25*, which is of the same design as that embodied in the taffrail unit. In the repeating instrument, the pins, *23*, are operatively engaged by a hook, *26*, which is suspended from the lever, *27*. This lever is fulcrumed at *29*. An armature, *28*, is located at the end of the lever so as to be in the magnetic field of the magnet, *19*. Thus, it is evident that when the switch is closed in the operating unit, the magnet causes the lever, *27*, to actuate the disk, *22*. To prevent this disk moving too freely, and to hold it in a set position, a blade spring, *30*, is provided to strike between and engage the adjacent pins, *23*. This blade is suspended at the end of a yielding spring, *31*.

The operation of the device in actual use is as follows: The taffrail unit, through the medium of the whirling drag, operates the pointers, *9* and *10*, which record the run of the vessel. As the disk, *12*, revolves, the pins, *13*, successively depress the spring switch, *14*, closing the electric circuit which energizes the electromagnet, *19*. This unit rocks the lever, *27*, which lifts the hook, *26*, which, in turn, causes the disk, *22*, to rotate in unison with the pointer, *9*, on the taffrail instrument.

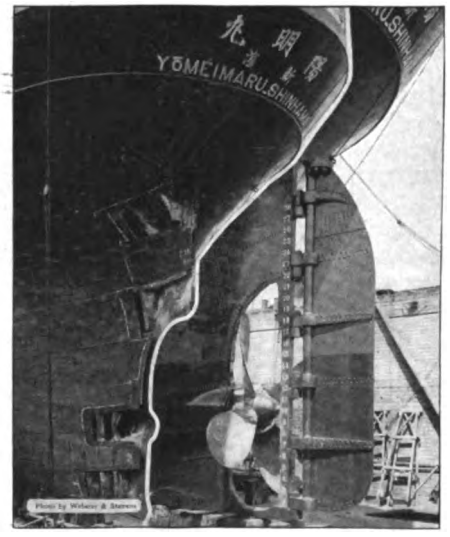
Industrial Signals

A paper on audible signals was recently presented before the Rochester, N. Y., section of the American Institute of Electrical Engineers by V. Karapetoff, professor of electrical engineering, Cornell university, Ithaca, N. Y., who is carrying on investigations for the Klaxon Co., New York. He points out that means should be provided for readily locating members of shipyard staffs. He described a device consisting of a type of horn used on automobiles having a diaphragm with an anvil at its center. A different call is assigned to each man, so that all the telephone operator has to do is to pull down a lever, setting in operation a special instrument which causes the horn to sound. The call is produced by a toothed wheel striking the anvil. The wheel is operated by an electric motor. In offices where the noise is objectionable, the horns are replaced by gongs, bells, buzzers, whistles or incandescent electric lamps.

A further application of electric horns in shipyards consists of an extension for telephone calls. The ordinarily telephone bell, it is pointed out, is not loud enough to be heard by the foreman when he is away from his desk. In this case, a relay is connected in parallel with, or in place of, the telephone ringer. When it is actuated it closes a secondary circuit which makes the electric horn sound.

Quick Repair Job

Doing a repair job in 20 days that ordinarily would have taken twice that time, the Skinner & Eddy Corp., Seattle, under the direction of General Manager David Rodgers, has completed its first extensive repair contract with flying colors. The vessel on which this fine record was made, is the Japanese steamship YOMEI MARU, which arrived in Seattle with only the upper five feet of her 32-foot rudder on the rudder post, the balance having been carried away in heavy weather. There was just a sufficient amount of the



REPAIRS ON THE STERN OF A JAPANESE LINER RECENTLY MADE AT SEATTLE

rudder left to give the ship steerage way. By a splendid burst of speed, the Skinner & Eddy yards turned the vessel back to her operators in 20 days. In this time it was necessary to install a new stern frame, a new rudder post and a new rudder. The work also included the removal of a number of damaged plates around the stern. Three shifts worked on the job each day the vessel was in drydock and the owners are greatly pleased inasmuch as the speed of the repair plant has saved the owners a large sum of money.

Color Blindness Tests

Color blindness on the part of ships' officers and crews at sea and engineers and trainmen ashore opens the way for serious accidents. It is imperative that men in these positions be free from this defect to enable them to distinguish instantly the colors used as signal lights.

It has long been felt that the usual methods for determining color blindness are defective to a certain degree and on account of the importance of normal color sense to safety at sea and ashore, George L. Collins, a surgeon in the United States army, recently conducted exhaustive tests.

In his conclusions, Mr. Collins states that color blindness occurs in 8.6 per cent of men and 2.2 per cent of women in every-day life among healthy individuals of America. Color blindness to a degree dangerous in occupations requiring colored signal lights occurs in 3.1 per cent of men and 0.7 per cent of women.

Color blindness is best detected by testing with colored lights of known spectral composition. It was found to be of great importance to divide the color blind into the dangerously color blind and the harmlessly color blind. This may be done satisfactorily and expeditiously with the Edridge-Green lantern after gaining an understanding of the principles of the test employed.

The Jennings test results in the rejection of a large percentage of subjects who should be accepted, especially among the more intelligent, but it possesses certain practical features which render it superior to other tests in certain lines of examination where great accuracy and classification of color defects are not essential. It should not be used for testing sailors or trainmen.

Among refractive conditions of the eye, color blindness occurs least frequently in eyes apparently without demonstrable refractive error; it occurs most frequently in eyes showing mixed astigmatism.

In this connection it may be said that the following classes of color blind should not be permitted to be sailors or trainmen: (1) Those possessing a color perception containing three or less units; (2) those possessing a greater number of units than three who have the red end of the spectrum so shortened as to prevent the recognition of red light at a distance of two miles; and (3) those with a central scotoma for red and green.

The Sperry Gyroscope Co., Brooklyn, N. Y., displayed one of its compass installations at the recent annual industrial exhibition of the Brooklyn Engineers' club. This device was described in full in THE MARINE REVIEW of March, 1919. The equipment shown consisted of a twin gyroscopic compass which was kept in constant operation. The position of the panel, generator, pelorus and repeaters gave a practical idea of the flexibility of the company's system for merchant ships.

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Draftsmen Meet

The revival of the American merchant marine was the subject of a stirring address by A. H. Hagg, national president of the American Society of Marine Draftsmen, at the seventh annual convention of the society held at Boston recently. "In 1916 the waterborne commerce of the world was approximately $85,000,000,000," he said. "The import and export commerce of the United States was approximately $4,500,000,000, of which 9 per cent was carried in American ships, and the other 91 per cent in foreign ships. Recent figures show 979 vessels built for the United States shipping board reaching a deadweight tonnage of 5,491,456 were built.

"Two vital points should be considered in the building of a new marine," continued Mr. Hagg, "underwriting and inspection must be controlled by this country. Naval architects and marine engineers of the highest caliber abound in this country; but we humbly acquiesce to the demands of competitors in instructing us as to how our ships should be built.

"What we need is American-designed ships built in American shipyards, under American classification and carrying American exports."

Mr. Hagg feels that the near future will see 50 per cent of United States commerce carried in American bottoms, instead of the 9 per cent before the war.

Other speakers at the convention were: Harry E. Gould, superintendent of the Fore River shipyards; Lieutenant Gorkey of the Charlestown navy yard, and J. B. Saddler, treasurer of the society.

Building Marine Engines

(*Concluded from Page 392*)

more liners are placed in position. The valve is now set correctly for both go-ahead and reverse motions.

Setting the valves on an engine equipped with a stephenson link motion is largely a matter of good judgment. It is always to be borne in mind that moving the eccentric does one thing only, that is, to retard or advance the lead. Setting the valve on its stem equalizes the distance it travels on each side from the center but in the case of engines like the one under consideration, the high pressure and intermediate valves have no provision for centralizing, so that the use of liners for this purpose is necessary.

Minor operations such as installing the lubricating system, air pump, lagging the cylinders, etc., next follow after which the engine is given a thorough test to see that it works right. In this test it is turned over by the turning engine only. A test under steam is not made until the engine has its dock trials, after being put aboard the vessel.

All cast iron surfaces are given a coat of filler and several coats of paint after which the engine is taken apart for shipping. After the engine is dismantled, the eccentrics are carefully scribed for their keyways, the location being derived from the keyseats already in the crankshaft. The keyseats are now cut in the eccentrics. This work is generally done on the slotter.

The cylinders are taken off and shipped as a single unit on one flat car. To transport the remainder of the engine, four other flat cars are required. The bed plate is shipped integral with its crankshaft while the columns are shipped separately. All steel parts are given a liberal coating of slush to prevent rust while the smaller units are packed in boxes.

The operation of dismantling and packing the engines is carried out in remarkably short time. As a matter of fact, it takes less than a day and a half completely to dismantle and pack one of these engines for shipment. The assembly is carried out in an average of two days.

To Make Propellers

To meet the expansion of its market, the Thacher Propeller & Foundry Corp., Albany, N. Y., has recently been incorporated to take over the business of George H. Thacher & Co. The company will conduct a general foundry business but will specialize on modern propellers of approved design. A fireproof plant will be constructed at a cost of approximately $200,000. The number of employes will expand from 165 to 400.

The incorporators of the company are: George H. Thacher, Thomas D. Thacher, Horace S. Bell, William S. Hackett and John A. Delehanty, all of Albany. The capital stock of the company is placed at $1,200,000 with paid up capital of $1,000,000. The company will open offices in New York, Chicago and London, England.

Lloyd's Elects

At a special meeting of the general committee of Lloyd's register, held recently, Sir Thomas L. Devitt was re-elected chairman of the committee for the ensuing year, Sir John H. Luscombe was elected deputy chairman and treasurer and Sir Thomas J. Storey was re-elected chairman of the subcommittees of classification. Sir Thomas Devitt has held his office since 1909. Upon the retirement of Sir Edward Cooper from the office of deputy chairman and treasurer, the committee passed a resolution recording its sense of the great ability and unremitting care and attention which he has devoted to the affairs of Lloyd's register during his tenure for the past two years of the office of deputy chairman and treasurer. Sir John Luscombe held the office of deputy chairman and treasurer from 1904 to 1906.

Lord Inchcape and Sir James Hills were re-elected, and Sir Kenneth S. Anderson and Lieut. Commander August B. T. Cayzer, R. N., were elected members of the committee.

Shipping Firms Increase

During the month of June, 21 new shipping companies were organized with an aggregate capital of $55,550,000, according to the *Journal of Commerce*, New York. This is the largest indicated investment for any month since June, 1917. The following table gives the names, state of incorporation, and authorized capital stock of the new companies organized during the last two months:

MAY, 1919

American Steamship Navigation Co., Del.	$ 100,000
Argonaut Salvage Corp., The, Me.	10,000,000
Globe Ship Supply Co., Pa.	50,000
Haines Ship Agency, Inc., Del.	100,000
Houghland Boat and Barge Lines Co., Ind.	150,000
International Transport Co., Del.	200,000
Marine Traveling Co., Mass.	200,000
MacLean Navigation Corp., Del.	200,000
New York & Norwalk Line, Del.	100,000
Overseas Sailing Ship Corp., Del.	500,000
Omega Steamship Corp., Del.	250,000
Polish-American Steamship Corp., Del.	4,000,000
Queen Steamship Line, Inc., Del.	100,000
Ramsay Navigation Co., Del.	100,000
Rourke, John, & Sons, Ga.	300,000
Safety First Boat Co., Del.	100,000
Steward Davit & Equipment Corp., Del.	550,000
Valentine, C. G., & Co., N. Y.	100,000
Van Praagh Steamship Line, Inc., Del.	50,000
World Steamship Line, N. Y.	50,000
Total	$17,200,000

JUNE, 1919

American - French - Mediterranean Steamship Corp., N. Y.	$ 200,000
American Shipyard Co., N. J.	100,000
Atlantic Navigation Corp., Del.	1,000,000
Arsenio Jose Froes & Co., Del (engage in ocean commerce)	26,400,000
American Steamship Corp. (operate)	10,000,000
Cuban Atlantic Transport Corp., Del. (build and operate)	1,000,000
Eldorado Steamship Co., N. Y. (build boats, etc.)	50,000
Gratia Navigation Co., Del.	250,000
Italian Star Line, Inc., Del.	1,200,000
Kajetan Blaszkiewicz Polish Steamship Co., N. Y.	250,000
Kanabeck Steamship Co., Del.	300,000
Landis Navigation Corp., Del.	200,000
Lincoln Steamship Corp., N. Y. (navigation)	100,000
New York & China Transportation Co. (operate)	10,000,000
Polish Navigation Enterprises, Inc., Del.	3,000,000
Portuguese-American Navigation Co., R. I.	100,000
Red Cloud Steamship Co., Del. (build and operate)	300,000
Sea Carriers, Inc., N. Y.	500,000
Triton Shipping Corp., N. Y.	100,000
Victory Carriers, Inc., N. Y.	400,000
Wells, Geo. H., Steamship Corp., Del.	100,000
Total	$55,550,000

The Pensacola Shipbuilding Co., Pensacola, Fla., launched the 10,000-ton steel steamer ESCAMBIA, recently.

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Activities in the Marine Field

Latest News From Ships and Shipyards

May Hinder Fall Grain Movement

DUE to the fact that the Canadian government has not followed the action of the United States in fixing a like price for wheat, the United States government has restrained Canadian vessels from using our ports. The result of this action is that the Canadian government will have to move its grain entirely through the Georgian bay ports and Montreal. If this is to be the case, it will restrict the fall movement of grain as far as United States' lake vessels are concerned as the former coastwise laws of Canada have been reinstated which means that an American ship cannot trade between two Canadian ports. It is predicted that some satisfactory adjustment may be made in the near future to relieve the situation.

* * *

The Port Arthur Shipbuilding Co., Ltd., Port Arthur, Ont., recently launched the CANADIAN SAILOR, a 3400-deadweight ton steel cargo vessel. She is one of the Canadian merchant marine fleet now building in Canada for the department of marine and is the second vessel of this type to be launched by the company. The CANADIAN SAILOR is 260 feet long, 40½ feet beam with a molded depth of 23 feet and carries British Lloyds 100 A-1 rating.

* * *

The association of commerce, Chicago, has taken steps to have vessels allocated by the shipping board to load at Chicago direct for Europe. Shipping men of Chicago claim that outward bound vessels will be assured of at least one full cargo a day. It is said, however, that return cargoes present the real problem as it would prove unprofitable for these vessels to return in ballast.

* * *

A deep waterway from Chicago to the Gulf of Mexico is an assured fact, due to the passage of five bills by the Illinois state legislature. The waterways to be utilized are the Chicago drainage canal, a state canal and the Illinois and Mississippi rivers. The bills authorize the state of Illinois to proceed with the construction of waterways and to use such portions as deemed necessary of the old Illinois and Michigan canal. An issue of $20,000,000 in bonds has already been voted upon. Preliminary work is in progress and actual construction is expected to be under way by fall.

* * *

The United States government is to widen Grosse Pointe channel to permit vessels of deep draft to pass through with safety. Bids are being asked by Col. E. M. Markham, United States engineer, who announces that the bids received at the United States engineer's office, Sault Ste. Marie, will be opened after four p. m., July 22. The specifications include the removal of approximately 1,250,000 cubic yards of soil.

* * *

The Crosby Transportation Co., Milwaukee, has chartered the steamer LAKELAND for two months. The vessel will operate in Lake Michigan trade.

* * *

It will cost approximately $7500 to repair the steamer GOGEBIC which went ashore on Pie island, Lake Superior, recently. The vessel is in drydock at Port Arthur, Ont.

* * *

The steamer HENRY STEINBRENNER, downbound with ore, grounded on the middle ground below Point Iroquois recently, due to fog. The tug ALABAMA and the lighter RELIANCE went to her assistance.

* * *

Port Huron, Mich., is badly in need of docks, according to M. S. McDiarmid, assistant engineer in charge of survey work being made in the American channel at that port by the United States lake survey steamer SUPERIOR. Channel data are being obtained preparatory to dredging operations with the object of giving upbound steamers an opportunity to pass on the American side and leave the Canadian channel wholly for downbound vessels.

* * *

Two steamers recently built at Duluth for the Emergency Fleet corporation, the LAKE GLEBE and CHAMBERINO were tried out late in June and after having their compasses adjusted they proceeded to tidewater.

* * *

Repairs on the steamer GLENISLA which struck in Jackfish harbor recently have been completed at Port Arthur. As soon as the vessel left the drydock her place was taken by the GLENSHEE which sustained considerable damage to her bottom when she went ashore in Buffalo harbor recently.

* * *

The steamer C. H. STARKE, which recently went ashore at Grassy island while upbound, was released by the tug A. C. HARDING. No serious damage was reported to the vessel.

* * *

The Reeves Coal Co., jobber of Minneapolis, has taken over the old St. Paul & Western dock on Conners point, Superior, Wis. This dock has a capacity of 175,000 to 180,000 tons. Associated with the Reeves company are large eastern producers which gives the company extensive connections with mines in Ohio and West Virginia.

* * *

The steamer LAKEWOOD, which is to be fitted up for lower lakes grain trade, has been docked at Port Huron, Mich., where she will be cut in two and shortened about 20 feet to make her a Welland canal size craft.

* * *

The passenger steamer SOUTH AMERICA, which recently went aground at Bois Blanc island, was released by the wrecking steamer FAVORITE.

* * *

Edward Harris, Duluth, a porter on the steamer D. M. PHILBIN, was drowned while swimming at Conneaut recently. The body was recovered and sent to Duluth.

* * *

The flagship OCTARARA of the Great Lakes Transit Corp. fleet made a trial trip recently just before the opening of the passenger season. The distance covered was approximately 20 miles, the vessel running from Buffalo to Port Colborne.

* * *

Two men were instantlly killed and two others fatally scalded when a plug on the steamer ATIKOKAN blew out recently. The dead men are John Ferguson and T. J. Cody and the injured, Thomas Gibson and Alexander Watts.

* * *

The steamer ANNA C. MINCH while outward bound from Duluth loaded with ore grounded in the channel in the turn below the interstate bridge. She was released by the tug MISSOURI. A dense fog was the cause.

* * *

A menace to navigation, in the shape of a float or scow, was recently sighted by the steamer CORNELL in Lake Superior. The derelict was described as approximately 16 feet long by 8 or 10 feet wide, built of heavy timber. The poinit at which it was seen was south 82 degrees, west true 28½ miles from Eagle harbor lightship.

* * *

The steamer MATTHEW ADAMS was damaged to the extent of $2000 recently at Duluth while passing the interstate bridge. She was bound up the river, loaded with coal, and when almost through the draw, the tender swung the bridge against her, damaging the afterhouse, a life boat and motor tank. She made temporary repairs before loading.

* * *

Capt. Joseph Doville, formerly of Cleveland, died in Rochester, N. Y.,

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recently. He was 78 years old and had been connected with Great Lakes trade for a number of years. He was a member of the firm of Benham & Doville, vessel agents. He retired from active business 18 years ago. He is survived by two sons, Harry C. and Frank J. Doville.

* * *

The break at the neck of Presque Isle peninsula, which has been rapidly widening, is to be filled in at once, according to a recent report to the effect that General Taylor, assistant chief engineer of the war department, issued orders to the Buffalo engineer's office to undertake the work immediately.

* * *

The steamer LUZON, which was ashore at Cove island, was placed in No. 2 dry dock, Cleveland. About 17 plates as well as her forefoot is damaged.

* * *

The Marietta Mfg. Co. has equipped a plant at Point Pleasant, W. Va., to build river boats. The company's first contract calls for work on four 200-foot twin screw towboats of the tunnel type. The plant comprises all the departments necessary for modern shipbuilding and is superintended by S. J. Struben. The company's inspector is F. Paradies. The towboats will be used by the railroad administration on the Mississippi river. Cost of the vessels will be $330,000 each. The construction work on these craft is to be divided between the above named company, the Minneapolis Steel & Machinery Co. and the St. Louis Boat & Engineering Co.

Late News From Atlantic Seaboard

A REMARKABLY fast passage of 24 steaming days from Capetown to Boston is recorded by the Bucknall liner KANDAHAR, Captain Crome, which averaged a fraction less than 13 knots an hour for the entire passage. The distance from Capetown to St. Lucia, where the ship bunkered was covered in 17½ days and the run from St. Lucia to Boston consumed 6½ days.

* * *

Bunker trimmers at the port of Boston employed in coaling foreign ships have been granted an increase in wages from 67½ cents to 75 cents per hour. While the new scale was being arrived at, shipping was delayed for a brief time.

* * *

W. E. STEVENSON, Boston manager of the International Mercantile Marine Co. died June 8, at his home in Brookline, Mass. He had been identified with steamship interests in Boston 25 years and until two years ago was freight manager, becoming general manager when J. H. Thomas was transferred to New York. Mr. Stevenson was 55 years old and leaves a family.

* * *

A submerged object near Boston lightship knocked two blades from the EDGAR F. LUCKENBACH'S propeller while that transport was leaving for Brest. The LUCKENBACH was delayed several weeks for repairs.

* * *

Owing to scarcity of sailors the sailing ship BRYNHILDA, Captain Kennealley, was held at Boston nearly two weeks while eight men were being procured to fill the places of deserters. The ship is chartered to load 1,100,000 feet of lumber at Halifax for England at $50 per 1000 feet.

* * *

The Paragon Shipping Corp., Boston, has been allocated two new ships, the LAKE FOUGARD and the CHATAUQUA. These will operate on the new Boston-River Plate route.

* * *

CAPT. R. H. ALLEN of the steamer BELFAST on the Boston-New York all-water route, has been recommended for the distinguished service medal, having saved 162 men from the mine sweepers DOUGLAS and COURTNEY during a gale in the Bay of Biscay, April 27, 1919, while the sweepers were bound from Brest for Hampton Roads. Captain Allen was in command of the TERESA, acting as convoy. He has been discharged from government service and returned to his position with the Eastern Steamship Lines, Inc.

* * *

The captain and three of the crew of the 3-mast schooner J. B. KITCHEN, bound to Ireland from Halifax, N. S., with a load of lumber were rescued at sea after the craft took fire. The distressed vessel was sighted by the French cruiser SOMME which ran alongside. The work of rescue was difficult as a high sea was running at the time. The vessel was abandoned.

* * *

The CUMBERLAND, first of the shipping board's Ferris-type wooden vessels to undertake a transatlantic trip, made the passage from Boston to Liverpool in 14 days.

* * *

The Submarine Boat Corp., Fort Newark Terminal, N. J., on July 1 launched what it claims to be the first vessel to be christened with ginger ale. This is the WACO, a 5000-ton ship which was christened by Mrs. J. H. O'Hara, Waco, Tex., with a special brand of ginger ale manufactured in Waco.

* * *

The schooner CHARLES E. WYMAN foundered in a gale off Cape Sable recently. All hands were rescued and landed at Yarmouth, N. S. The vessel, which was built in 1882 at Grand Haven, Mich., was enroute from New York to St. Johns, N. F. She registered 222 tons net.

* * *

The 4-mast schooner BRADFORD E. JONES, recently launched at Boothbay Harbor, Me., has loaded a cargo of over 1,000,000 feet of lumber which is intended for Buenos Aires. The ship is owned by Crowell & Thurlow, Boston, and it is expected that her first return trip will half pay her total cost.

* * *

When the whaling schooner MARGARET, Capt. Louis Lopes, docked at New Bedford, Mass., recently after an 8-month cruise on the western grounds, the skipper told how a sailor shoveled $20,000 worth of ambergris into the sea thinking it was useless refuse. The ambergris was taken from the intestines of a sperm whale and lay on the deck alongside sections of drying blubber. As soon as Captain Lopes discovered the loss a boat was instantly lowered in a vain attempt to save some of the valuable material but their efforts were useless as it sank too rapidly.

* * *

The steamer YANKEE, operated by the shipping board, recently sank off Fire island after having been in a collision with the Italian steamer ARGENTINA. The YANKEE'S crew were rescued by the Italian vessel. The YANKEE was a Great Lakes product, built at Cleveland last year. She was engaged in coasting trade and registered 2418 tons.

* * *

Schooners are bringing good prices. Through the offices of a ship brokerage company of Boston, the fishing schooner HIRAM LOWELL of Bucksport, Me., was sold to Portuguese interests for $12,500. She will enter packet service between Newfoundland and Portugal.

* * *

The steamship AGWIDALE recently had her bow smashed in a collision with the

Nobility Swabs Decks

WHEN the British steamer BERMUDIAN, *recently docked at New York for the first time in two years, the officers told a story of how Russian nobility of the highest rank had worked at swabbing decks and passing coal. On April 27, 1919, the vessel after having been engaged in war transport service, arrived at Constantinople where she took on 698 Russian noblemen and noblewomen who were fleeing from their native country. The party included 32 princes, the Empress Dowager of Russia, 20 generals and a large number of barons, counts and countesses. The* BERMUDIAN *was shorthanded and crowded for space. Enroute from Constantinople to Malta, where the party debarked, the noblemen turned to with the crew and at night slept on the decks.*

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transport IMPERATOR. The damaged vessel is in drydock at New York for repairs. The AGWIDALE is a 7500-ton vessel built for the United States shipping board last year at Newport News. She has made three round trips across the Atlantic.

* * *

The WISCONSIN BRIDGE, a shipping board vessel built by the Submarine Boat Corp., will shortly sail for Archangel with a cargo that originally was intended for the MELROSE, which vessel will go to London.

* * *

During a severe thunder storm recently a large traveling crane at the Washington navy yard was struck by lightning which fused some of the superstructure.

* * *

The Pacat Steamship Corp., New York, recently leased Pier No. 7, North river, from the railroad administration. This pier will accommodate four ocean-going steamships at one time. The company purposes to use the pier exclusively for its own steamers.

* * *

The Clyde line has withdrawn its service between Philadelphia and New York. Formerly the company operated two boats on this line with biweekly sailings. Lack of patronage was the cause of the action.

* * *

The motor schooner TURLITE damaged her machinery to the extent of $6000 on a voyage from New York to Santos.

* * *

The steamer LADY GWENDOLEN was recently sold by the British & Irish Packet Co. to Bowring & Co., agents for the Red Cross line.

* * *

The schooner THOMAS A. FRANCIS from Pensacola, Fla., with a cargo of lumber, went ashore off the bar at Edgemont, near Tampa, Fla., and is a total wreck.

Activities Along the Gulf Coast

CAPT. JAMES G. BEAZELL, a former master of steamboats that operated on the lower Mississippi river, died June 24, at Munhall, Pa. He was born 57 years ago and was active in the river trade since early manhood. In early life he plied on the Pittsburgh district rivers but left for the lower Mississippi about 20 years ago and commanded boats running between New Orleans, Louisville and St. Louis.

* * *

The Mobile Shipbuilding Co., Mobile, Ala., launched the MOSHICO, a 5000-ton steel cargo carrier, on July 3. This vessel is the first steel ship built by the company and 12 of the same type are to be completed for the Emergency Fleet corporation.

* * *

The Hodges Boiler Works, Mobile, Ala., launched the 100-ton steel seagoing tug JIM SID, May 23. The tug was built for the Gulf Barge & Towing Co., New Orleans, at a cost of $75,000 and is the first steel boat to be completed at Mobile. She was named for the two New Orleans boys, James and Sidney Rollins, who lost their lives at Chateau Thierry.

* * *

Construction of a new fruit wharf to cost $400,000 and to have steam heat as well as depressed railroad tracks so that freight cars will be on a level with the open sides of the fruit ships, has been commenced on 1000 feet of harbor front, between Paula and Louisa streets, New Orleans. The Cuyamel Fruit Co. has advanced $390,000 for the work, without interest, to the board of port commissioners, and this company will have the exclusive use of the wharf. At present, 15,000,000 bunches of bananas come into New Orleans annually and the Cuyamel company is putting on four more steamers to handle its banana trade with Honduras each week. The wharf will be completed in January, 1920, and will be prepared to maintain heat necessary for the preservation and ripening of the bananas in the coldest weather.

* * *

The $20,000,000 army supply base, warehouse and wharf constructed at the industrial canal and the river, New Orleans, were completed June 15, according to Maj. Pierson Hoover, constructing quartermaster in charge, and will be turned over to the government early in July. The army will retain one of the three warehouse units, but the other two and the 2000-foot wharf will be loaned to the city at a nominal rental for use in foreign trade. More than 6000 men have been employed every day on the work of building this supply base and the payroll has averaged $178,000 a week.

* * *

The United States Shipbuilding Corp., New York, recently launched the 2700-ton steamer ELIAS ISSAIAS. This vessel is 250 feet overall, 230 feet between perpendiculars, 39 feet beam, 22 feet 6 inches deep and will sail under Greek registry.

* * *

Frank Waterhouse & Co. have just dispatched the Japanese steamship ORIDONO MARU to Europe with a cargo of barley. This company intends to establish a regular service between Seattle and northern Europe with Japanese vessels as quickly as the ships are available.

* * *

Marine insurance premiums collected during 1918 in Louisiana totaled $1,729,-164, against $1,579,087 for 1917. Losses paid during 1918 amounted to $540,507. These figures are contained in a report of the insurance department of the state government recently issued at Baton Rouge, La.

* * *

New Orleans has been designated the export center for the Consolidated Steel Corp., a combination of 11 of the great steel companies of the United States, according to James W. Porch, manager of the Lukens Steel Co., at New Orleans, one of the firms in the combination. The Consolidated Steel Corp., Mr. Porch added, will construct a warehouse in New Orleans at a cost of $300,000 for handling steel products to Latin America and the Orient.

* * *

The French government has sued the owners of the steam tanker AUGUSTA, of New Orleans, for $924,000 for damages to the steam schooner CAPITAINE DE BEAUCHAMPS, of France, alleged to have been sustained in collision with the AUGUSTA at the mouth of the Mississippi river a few weeks ago. The suit is filed in the form of petition for libel in the United States court, by Denegre, Leovy & Chaffe, proctors for the French government. Sudden changing of the course of the AUGUSTA, after passing signals had been given, is alleged as the cause of the accident.

* * *

The board of commissioners of the port of New Orleans is making a survey for the establishment of a large lumber wharf, warehouses and storage platforms on the industrial canal. This is the first provision for the handling of lumber exports ever made in the port of New Orleans. The estimated cost is about $350,000.

* * *

The Osaka Shosen Kaisha, the large Japanese steamship company which has been operating steamers from Yokohama to New Orleans via Rio, and bringing hundreds of thousands of bags of coffee to the Louisiana port, announced early in June that about the middle of July it would open a direct steamship service between New Orleans and Yokohama, Kobe and other Japanese ports, in addition to the service via Rio. Steamers of 10,000 and 12,000 tons are being used in this triangular service, and the direct line will operate ships of the same size. Hong Kong, Shanghai and other Chinese ports also will be included in this service, which will have for outbound cargoes mainly cotton and steel, while the inbound cargoes will be Japanese and Chinese raw products, with tea as one line.

* * *

Gulfport, Miss., is to begin work this summer on a municipal pier, to cost approximately $8000.

* * *

Matthew Hale, president of the South Atlantic Maritime association, Savannah, Ga., announced recently that he expects to have 14 vessels allocated to his or-company intends to put the new vessels ganization by the shipping board. The in the Brazilian, Carribean and West Indian trades.

* * *

The Foundation Co.'s yard at Savannah, Ga., has but nine remaining ves-

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sels to launch after which it will be closed. The material on hand for the construction of 10 more vessels on the company's contract will be loaded on the completed vessels as ballast and shipped to France. When working at full production the yard had a force of 2600 men.

* * *

The Chickasaw Shipbuilding Co., at Mobile, Ala., has laid the keels for two more 9600-ton steel vessels for the shipping board. The Mobile Shipbuilding Co. has laid keels for two more 5000-ton steel hulls, making six ships of this size on which this company is now working.

* * *

Direct ship service between New Orleans and Brazilian ports is assured by the allocation to the Mississippi Shipping Co., New Orleans, of five ships of 9600 tons by the shipping board. These ships are all from those seized when the United States entered the war against Germany, and are to be delivered July 1, Aug. 1, Sept. 1, Oct. 1 and Nov. 1, respectively. Similar allocations for South American trade are to be made to Jacksonville, Fla., Mobile, Ala., Pensacola, Fla., and Galveston, Tex., according to report from the Mississippi Shipping Co., the $1,000,000 corporation recently formed by St. Louis and New Orleans capital.

Up and Down the Pacific Coast

EXTENSIVE labor troubles are seriously handicapping British Columbia shipping. Since early in June, the longshoremen and seamen employed on coasting vessels have been on strike with no prospect of an immediate settlement. The British steamer MAKURA, from Australia, has been idle at Vancouver for two weeks and her inward cargo still remains aboard. This vessel's crew has refused supplies sent from shore by a nonunion crew and it is likely the liner will be sent to San Francisco, where her freight will be left. The coastwise service is badly paralyzed and several of the regular liners have been forced either to remain idle or curtail their schedules. The trouble at Vancouver is a part of the extensive labor troubles which have affected industry at Winnipeg and elsewhere in Canada. In some cases vessels have been discharged and loaded by volunteers and office help.

* * *

The lumber mills on Grays Harbor are exceedingly busy preparing about a dozen cargoes of railroad ties for shipment to the United Kingdom. This order runs from 15,000,000 to 20,000,000 feet and will be taken by shipping board vessels assigned to private operators. Several similar cargoes are also being dispatched from Puget Sound mills.

* * *

There is a heavy movement of railroad equipment through Seattle to Vladivostok. This material has lain in storage for more than two years and is now being forwarded as rapidly as possible. More material is arriving from eastern manufacturing sections of the United States so that the Russian trade is expected to remain active for several months. This material is being carried both by shipping board vessels and private operators.

* * *

Portland shipbuilders are encouraged by the success of G. M. Standifer, of the Standifer Construction Co., who upon his return from Washington, announced that five steamers of 9500 tons each had been restored to his plant, the contracts previously having been cancelled. Other yards at Portland are expecting reinstatement of cancelled contracts so that the situation on the Columbia river is more promising than it was a month ago.

* * *

Earnings of the port of Seattle for the first five months of 1919 show a net profit over and above expenses, interest on bonded indebtedness and depreciation, of $131,104.82. This is considered a splendid showing and is the best in the port's history for a similar period. In the first five months of last year the port earned $63,000 not deducting depreciation. The port's total income for the last five months was $774,076.46. Terminal expenses in the same period totaled $644,899.27.

* * *

For the first time, Chinese coal is being shipped to Alaska. The motorship W. F. BURROWS is enroute from Chung Wang Tao to Bristol bay with a full cargo of fuel from the former port. The BURROWS left Puget sound last winter with general cargo for Manila and Hongkong and on the return she is proceeding directly to the Alaska canneries of Libby, McNeill & Libby, where the coal will be used.

* * *

One of the most puzzling marine mishaps in north Pacific annals has been exhaustively investigated by the United States inspectors with the result that all members of the crew have been exonerated. The case is that of the new 8800-ton steel steamer WESTERN KNIGHT, built by the Ames Shipbuilding & Dry Dock Co., Seattle, for the shipping board. The WESTERN KNIGHT was assigned for Oriental service and soon after putting to sea with a full cargo she began to take water at an alarming rate. The weather was heavy and the pumps could not free the vessel. Finally, the master put back as the vessel was in extreme danger. The inspectors in their findings place the blame on no one but they indicate that the inflow of water might have been through the vents of the deep tanks on the port side. They find that the master's judgment was in error because he assumed that the inflow could not have been through these vents. Furthermore, both deck and engine departments were handicapped by a crew which was inexperienced to a large degree. They find that the master used rare skill and judgment in bringing the ship back to port. The WESTERN KNIGHT has again sailed after a month in port during which much of the cargo had to be discharged. The hull was found in absolutely seaworthy condition and no blame whatever attaches to the builders.

* * *

The Norwegian steamer KEY WEST, built by the old Seattle Construction & Dry Dock Co., Seattle, and since her completion in the service of the Canadian Pacific railway between Vancouver, B. C., and the Orient, has been chartered to carry a cargo of lumber from British Columbia ports to the United Kingdom.

* * *

CAPT. A. W. NELSON, veteran skipper of the Pacific Mail Steamship Co., died of heart failure recently. Captain Nelson sailed the Pacific for many years in command of Pacific Mail vessels. He was the author of YANKEE SWANSON.

* * *

A ship launching program for the San Francisco bay district is being planned for Admission day, Sept. 9. The Moore Shipbuilding Co. intends to send six big steel hulls into the waters of the Oakland estuary on California's birthday, but this record breaking feat will be somewhat eclipsed by the launching of the superdreadnaught at Mare island which is to be named after the state of California. The warship will be the greatest in the world, it is said, displacing 32,000 tons and having a speed of 20½ knots an hour.

Completes Drydock

AFTER 10 years of work which entailed an investment of $4,500,000, *the massive drydock at the Pearl Harbor naval station, Hawaii, is practically finished. The drydock is built of granite and concrete and is set in a basin dredged in coral. It is* 1029 *feet long and* 100 *feet wide on the floor. The walls and floor contain* 150,000 *cubic yards of concrete. Dredging operations were begun in* 1909 *and a cofferdam was built in* 1913. *Long piles had been depended on, however, to reinforce the floor and when the cofferdam was pumped out water pressure from underneath upheaved the entire structure, wrecking it completely, thus destroying in a few minutes the work of many years.*

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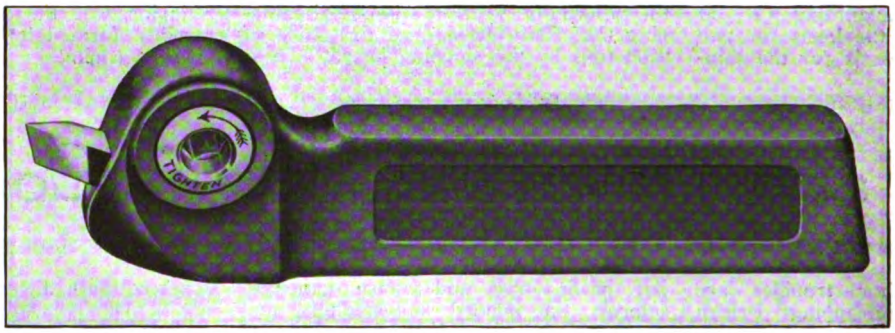
Equipment Used Afloat, Ashore

Tool Holder—Line Throwing Gun—Air Compressor—Stockless Anchor—Horizontal Boring Machine—Turret Head Tool—Steam Turbine—Heavy Duty Boring Machine

TOOL holders for accommodating bitts made of high speed steel offer various advantages, chief among these being the saving of expensive material. The tool shown in the accompanying illustration is a development of J. H. Williams & Co., Brooklyn, N. Y. The shank of the tool is drop-forged, heat-treated and accurately machined to fit the bitt and the clamping device. This consists of a cam which is actuated through the medium of a socket wrench that fits a depression broached in the cam. By this means the tool holder can be used in close juxtaposition with the work. These tool holders are made both right and left hand, offset and straight. Another type embodies a drop head which is particularly adapted for lathe and planer work, due to the fact that the design brings the cutting point of the tool well back so that springing does not cause the bitt to dig into the work.



TOOL HOLDER FOR LATHE OR PLANER WITH CAM CLAMPING DEVICE

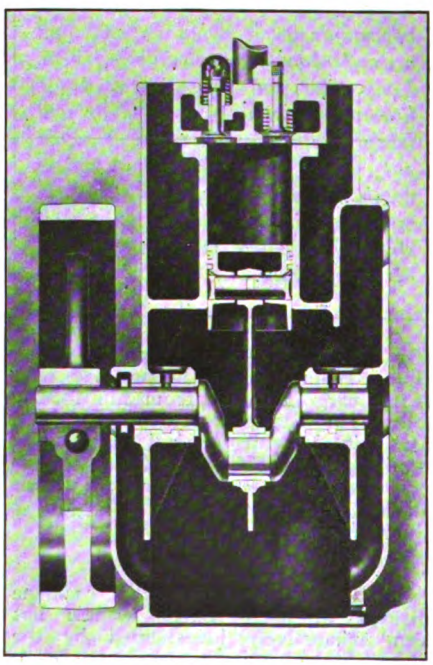
Line Throwing Gun

A line-throwing gun, made of foged steel and mounted on a steel carriage, is a recent development of C. C. Galbraith & Son, Inc., New York, manufacturer of life saving appliances. The device has been approved by the United States steamboat inspection service. The length of bore is 27 inches x 2½ inches diameter. The projectile weighs 18 pounds while the line used is tested to stand a breaking strain of 500 pounds.

Air Compressor

The machine shown in section in the accompanying illustration is an air compressor recently developed by the Ingersoll-Rand Co., New York. This machine, which was brought out during the war, is manufactured in four sizes with capacities ranging from 3 to 45 cubic feet of air per minute at a pressure of 100 pounds to the square inch. The machine resembles an ordinary internal-combustion engine in general design, due to the fact that it has a center crankshaft connecting rod, wrist pin and piston of similar design to those used in gas engine practice. The cylinder walls are lubricated by the splash system. The connecting rod is equipped with interchangeable die-cast bearings.

The machine is of the vertical type, single acting. It is built for belt drive and is carefully balanced to insure smooth running. For intermittent service, the smallest size is designed with an air-cooled cylinder, cooling being had through the medium of cooling flanges as commonly used on small internal-combustion engine cylinders. For continuous operation, however, this size is built with a water-cooled sylinder. The larger sizes of machines are water cooled only. They are built with a reservoir jacket. In the case of the largest size, however, a closed jacket is optional. This jacket is fed with water from the city mains through piping, or it may be supplied with a small circulating pump driven by a belt. It is said that the reservoir-type design affords ample cooling capacity for a full day's run of 10 hours without renewal. The compressors are simple in design and are substantially built. In shipbuilding plants, they are designed for use in close juxtaposition to the place where air pressure is required.



CROSS-SECTION OF SMALL WATER-COOLED AIR COMPRESSOR

Stockless Anchor

The anchor shown in the accompanying illustration was recently developed by Allison & Co., Chester, Pa. It is made of cast steel and comprises five parts. It weighs 10,315 pounds. The head and flukes are made integral and are joined to the shank by means of a pin of sufficient dimensions to withstand the strain to which this unit is subjected in use. The shank is a steel casting to which the shackle, also a steel casting, is fastened by a substantial shackle pin.

In designing this anchor, the sections were so proportioned that the strains set up when the castings cooled are equalized. Thus internal strains in the finished anchor, which might result in failures in actual use, are eliminated. It is pointed out that the flukes are wide in proportion and that they have parallel centers which feature gives good gripping power. It is said that the anchor cannot roll and that it takes a positive grip on both flukes.

The head is balanced to throw the flukes down instantly when the anchor takes the ground. All corners are round and smooth so that the anchor will not catch on the vessel's side or on the chain. The shackle and shackle pin are of standard dimensions.

It is pointed out that these anchors have been submitted to exhaustive tests and that they have been passed both

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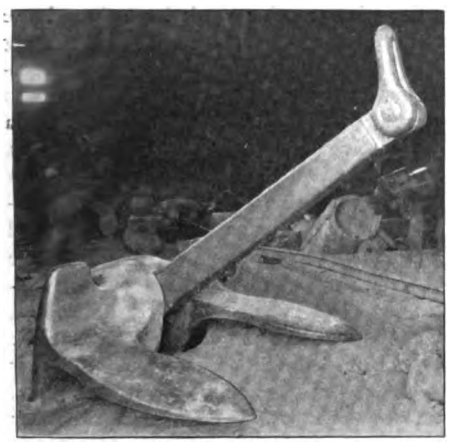
by Lloyds and the American Bureau of Shipping. Many are in use on ships of the Emergency Fleet corporation and in the United States navy.

Floor Type Boring Mill

Machining operations on heavy marine castings present many difficult problems that can be solved successfully only through the use of properly designed and adequate machine tool equipment. This is especially true in cases where the machining involves several operations such as drilling, boring, milling, tapping or rotary planing. Attention has thus been directed to the design of a machine tool which would be equipped to handle these several operations and save a large amount



CAST STEEL ANCHOR WEIGHING 10,315 POUNDS

of time otherwise spent in setting up heavy castings for machining.

The machine shown in the accompanying illustration is said to be capable of handling all the operations generally done with a floor-type boring machine. It is a product of the Landis Tool Co., Waynesboro, Pa.

The tool is driven through the medium of a motor which is mounted at the top of the column. The drive is directly connected to the main drive shaft which entirely eliminates the use of belting. The spindle drive is controlled by two friction cone clutches which are located at the back of the saddle where they are readily accessible for adjustment. This arrangement provides a reversal for the spindle during back facing and tapping. It is said that the location of the spindle drive eliminates torsion and consequent chattering during heavy cuts.

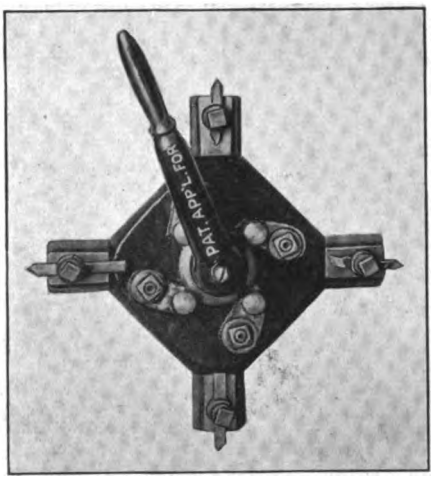
The spindle is high-carbon hammered steel, finished by grinding. The front end of the spindle slides through an adjustable bearing which is carried in the spindle sleeve. However, the spindle does not rotate in this bearing. The rotating motion is taken care of in another adjustable bearing on the external diameter of the spindle sleeve. It is pointed out that this design permits taking up for wear on the sliding spindle bearing.

The spindle is traversed by a long bronze nut which engages a square thread on the spindle. This nut has a bearing on the sides of the thread only. This arrangement provides a long bearing and as the nut and the spindle rotate together, except when the feed is engaged, wear is reduced to a minimum. End thrust in both directions is taken up by ball thrust bearings.

The spindle is driven radially through the medium of a screw feed actuated by a differential train of gears. The thrust of the spindle, when milling, is taken up by the main saddle casting and is independent of the thrust of spindle for boring.

Twelve changes of speed and feed are provided. All feeds are of the same rate, per revolution of the spindle, whether applied to the spindle, saddle or column traverse. No two feeds can be engaged simultaneously. Any one of the 12 feeds can be applied to the 12 speeds which gives in reality 144 rates of feed. A rapid power traverse is provided which is independent of the regular feeds. This actuates the spindle, saddle and column in all directions. The fact that no two feeds can be engaged at the same time helps to make the machine fool proof while the large variety of feeds provided adapt the tool to numerous machining operations. It is pointed out that the rapid power traverse expedites production.

Gear shifts are of the sliding-gear type and are enclosed to run in oil. All traversing gears are located between the ways and close to the guiding side. Gears and shafts are chrome nickel steel. Oiling of the saddle parts is accomplished through the medium of a syphon system which is said to insure an adequate supply of clean oil at all times.

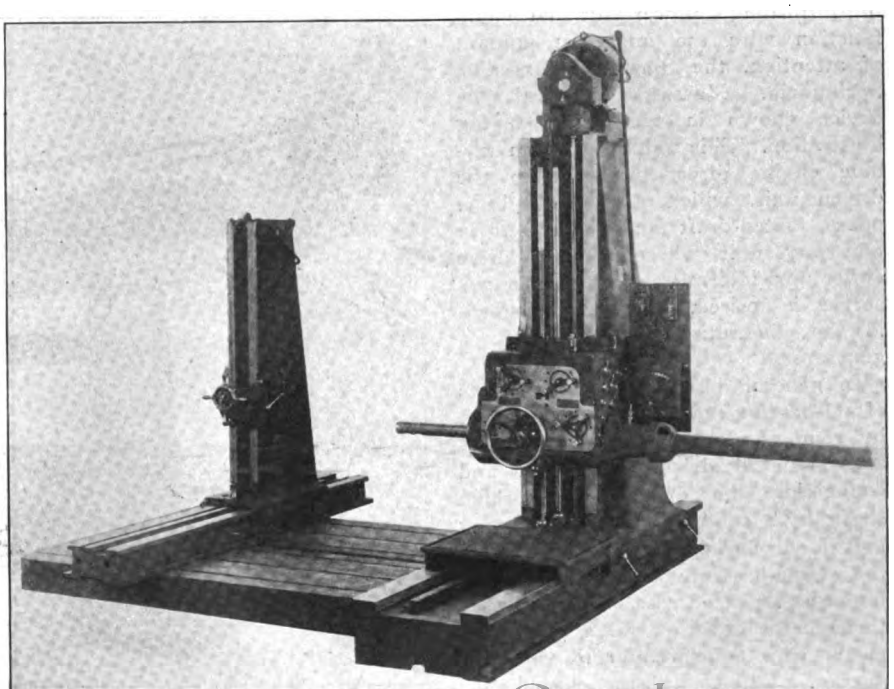


TURRET-HEAD TOOL WITH FOUR STATIONS

Turret Head Tool

The device shown in the accompanying illustration is a 4-station revolving turret head designed by the Production Tool Mfg. Co., Stillwater, Minn., to be attached to the clapper box of a planer or shaper. It is pointed out that this device gives the machine in question the same advantage as a turret lathe equipped with a multiple tool holding device.

The tool has a positive indexing mechanism which is readily actuated. While working on parts requiring a number of tools to complete the machining, it is a simple matter to set them, one after another, in the turret head. It is pointed out that



SELF-CONTAINED, MOTOR DRIVEN BORING MILL ADAPTED TO MARINE CONSTRUCTION

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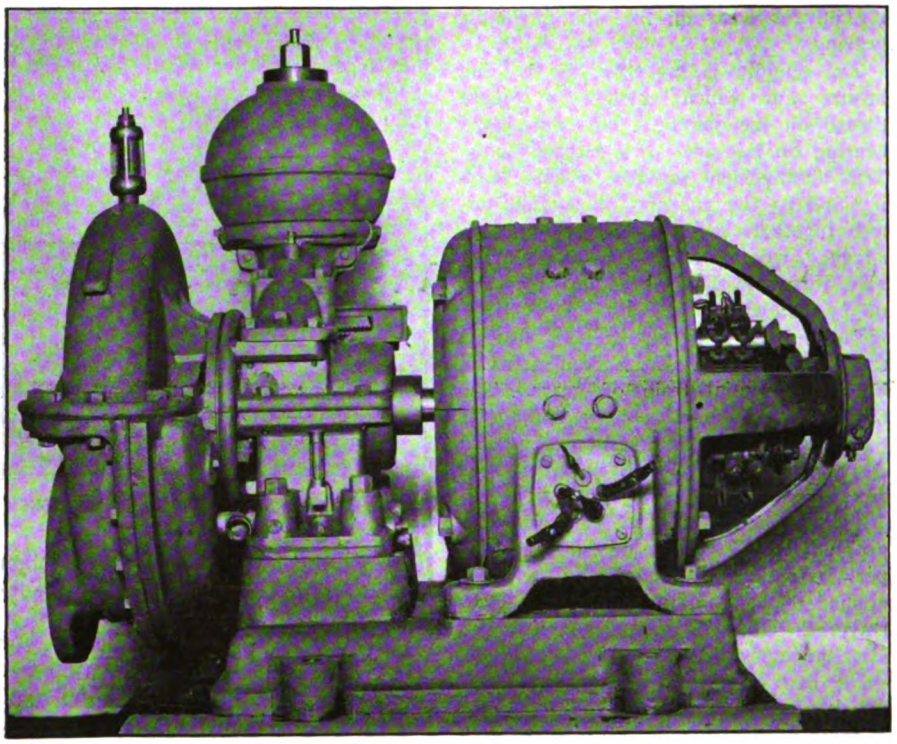


STEAM TURBINE DIRECT CONNECTED TO A LIGHTING GENERATOR

this saves a large amount of time usually spent in setting individual tools.

The device can be used on general work as well as on the manufacture of duplicate parts. The turret and base are cast iron while the tool posts and indexing mechanism are machine steel, case hardened to protect them from undue wear.

Compact Power Unit

With the object of conserving space and furnishing a power unit that would function with the minimum amount of attention, the Steam Motors Co., Springfield, Mass., developed the device shown in the accompanying illustration. This unit is a steam turbine engine direct-connected to the driven unit, which may be a bilge pump, forced-draft fan, dynamo, or in fact any unit wherein direct drive either for intermittent or continuous service is desired. The turbine shown in the illustration is coupled to a generator.

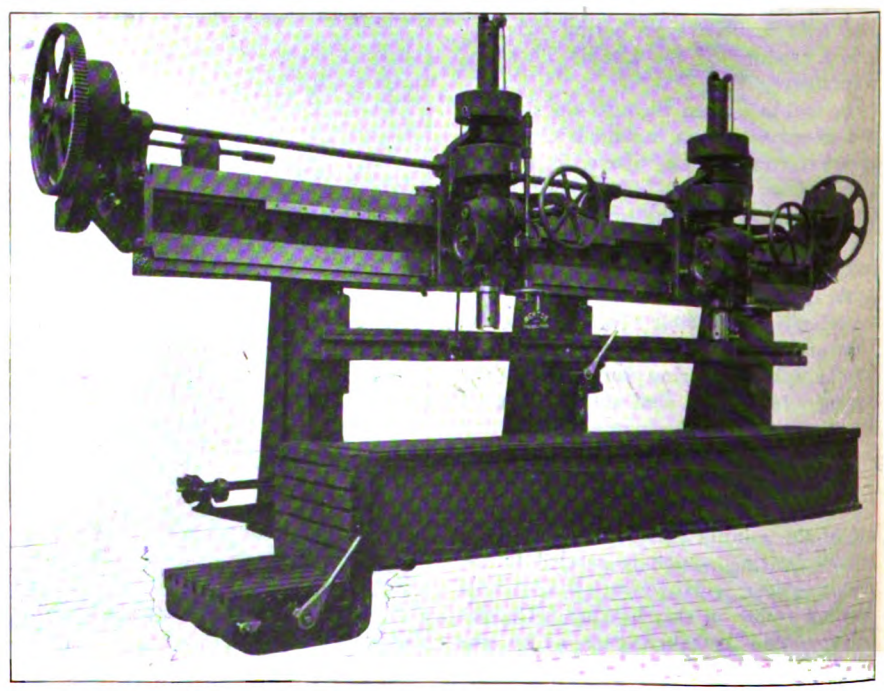
In general design the unit consists of a 1-bearing turbine so arranged that by removing the inboard bearing of any standard driven apparatus, and connecting the driven and turbine shafts by a solid coupling, a 2-bearing unit is produced. The turbine is of the single-pressure multivolocity-stage impulse type. Steam, after passing through the governor valve, enters the steam ring which connects with the nozzles. These nozzles expand the steam down to the required exhaust pressure, converting the static pressure into velocity energy. Two rotors are provided. From the buckets of the first wheel the steam is directed through the medium of stationary guides to a second wheel and from thence to the exhaust connection.

The casing is cast iron while the rotor shaft is high carbon steel, finished by grinding to insure accuracy. The rotors are of steel plate equipped with machined buckets. The stuffing box is of the double-labyrinth type. Lubrication is by means of a ring oiling system. A constant speed governor is actuated by the main shaft while an emergency governor is provided to insure a shutdown in case the turbine should start to run away. The direction of rotation is counter clockwise when facing toward the driven member.

Among ships equipped with these power units are over 160 lake built vessels for the Emergency Fleet corporation and 40 schooners for the French government. It is said that the units are simple to install and that they are capable of affording long continued service with minimum attention.

Heavy Boring Machine

Numerous machine tools built for other than marine work have found use among shipbuilders, among them being the boring machine shown in the accompanying illustration. This tool was primarily designed for boring holes in locomotive side rods and crossheads but its general design lends itself readily to many marine engine building operations where comparatively heavy and accurate boring is involved. The machine is made by the Newton Machine Tool Works, Inc., Philadelphia. The bed of the machine is of the box type equipped with T-slots on its upper surface for strapping work in place. At the side of the bed is an auxiliary platen provided with a lateral adjustment for boring operations on crossheads. The crossrail carrying two boring heads is supported by two uprights. These members also carry a rigid guide bar equipped with sliding brackets for supporting the boring bars. As this guide



BORING MACHINE EQUIPPED WITH TWO SPINDLES AND AUXILIARY SIDE PLATEN

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bar has a vertical adjustment, actuated by a rack and gear motion, it can be placed in close juxtaposition to the work which reduces springing of the boring bars to a minimum.

The spindle saddles have annular bearings on the bottom section of the rail which is said to insure close contact under heavy pressure. The top bearings are square and adjustments are made through the medium of bronze taper shoes.

The spindles are equipped with Morse tapers and revolve in bushed bearings. They are driven by worm gearing, encased for continuous lubrication. The side platen lends itself readily to a variety of operations aside from boring and reaming crossheads. The in-and-out adjustment is through the medium of a screw actuated by a rachet handle and as the spindle can be positioned at any point along the rail, it is evident that the boring bar can be located with great accuracy.

A novel feature of this machine is the design of the boring tools used. These are cup shaped, following in design an ordinary hollow mill. It is pointed out that they eliminate the necessity of drilling before the boring bar is brought into use and that the kerf is never more than 5/8-inch which permits the stock cut out to be used for other purposes. As two spindles are provided, it is possible to bore two holes in one piece at one operation. The minimum distance between the spindles is 30 inches while the maximum distance is 11 feet 4 inches. As the spindles can be operated at different speeds, it is possible to perform two operations at the same time.

Business News for the Marine Trade

The Gray's Harbor Iron Works, Hoquiam, Wash., is reported planning to enlarge its plant.

The Delbert Barge Building Co., Havre De Grace, Md., is reported planning to enlarge its plant.

A small addition will be erected at the plant of the John Trageser Steam Boiler Works, New York. J. O. Whittenback is architect.

The Reeves Coal & Dock Co., Lynchburg, Va., recently was incorporated with $500,000 capital, by O. W. Gardner, V. P. Clinton DeWitt and others.

Capitalized at $1,200,000, the Thacher Propeller & Foundry Co., Albany, N. Y., recently was chartered by H. S. Bell, T. C. and G. H. Thacher.

Plans for the erection of a 1-story plant addition, 25 x 50 feet, have been filed by the Perkins Marine Lamp Co., 1943 Pitkin avenue, Brooklyn, N. Y.

Plans have been prepared for erecting a plant, 1-story, 40 x 200 feet, for the Pipe Railing Co., 67 Sixth street, Long Island City, N. Y.

The Pioneer Welding Co., Syracuse, N. Y., recently was incorporated with $10,000 capital, by J. A. Brown, C. J. Ryan and W. J. Lowery.

The plant of the McWilliams Dry Dock & Machine Co., West New Brighton, N. Y., recently was badly damaged by fire. Repairs will be made.

The shipbuilding plant of the Ford Motor Co., Detroit, will be converted into a manufacturing plant, according to a current report.

The Anderson Shipbuilding Co., Kirkland, Wash., is said to be planning to convert its yard into a plant for repairing steel and wooden vessels.

The Harris Marine Engine Co., Wilmington, Del., recently was incorporated with $100,000 capital, to engage in the manufacture and sale of marine engines.

A recent Delaware incorporation is that of the Dominion & States Steamship Corp., Dover, Del., which has been chartered with $500,000 capital.

Plans have been completed for erecting a ship repair works for the Hinkley Towing Co., Oswego, N. Y. The plant will be built at an estimated cost of $40,000.

The Prospect Engineering & Welding Co., Brooklyn, N. Y., recently was incorporated with $100,000 capital, by F. J. and J. A. Wasilowski and W. H. Johnson, 55 Hanson place.

The American Shipyard Co., foot of Division street, Camden, N. J., has been incorporated with $100,000 capital, to engage in the building of ships, etc.

A charter recently was granted the I. H. Bogart & Son Shipbuilding Co., Boston. The company is capitalized at $25,000 and was incorporated by William M. Bogart, E. M. Simmonds, M. I. Brooks and others.

A contract has ben let to the Singer-Pentz Co. by the Bethlehem Shipbuilding Corp., Baltimore, for erecting a large warehouse, to be built at an estimated cost of $30,000.

The St. Paul Steamship Co., Ltd., Montreal, Que., recently was incorporated with $50,000 capital, by E. M. McDougall, Leslie G. Bell, Edward J. Waterson and others.

L'Heureux Lifeboat Launching Co., Ltd., Montreal, Que., has been incorporated to manufacture boats, boilers, machinery, etc., with $250,000 capital, by Frederick Sidgwick, William S. Fletcher and others.

Bids have been taken for erecting a structural shop, 100 x 366 feet, for the government at the Charlestown navy yard. The building will be erected at an estimated cost of $350,000.

Pumping equipment, tanks, etc., will be manufactured by the Canadian Tank & Pump Co., Ltd., Toronto, Ont., which was recently incorporated with $50,000 capital, by J. D. Copeland, 103 Balmoral avenue, F. H. Pratt, 144 Manning avenue and others.

P. DeRonde, F. H. Hall and I. G. Prioleau, 39 Claremont avenue, New York, recently were named as the incorporators of the Osprey Towing Co., New York.

N. D. Powell is president of the Baldt Anchor Co., Sixth and Butler streets, Chester, Pa., which recently let a contract for erecting a plant, 1-story, 52 x 120 feet.

The Binghamton Steamship Co., Ltd., Montreal, Que., recently was incorporated to build and operate vessels by E. M. McDougall, and others. The company is capitalized at $50,000.

The Bethlehem Shipbuilding Corp., Bethlehem, Pa., will erect a large valve shop at Readington, Pa. The plant, when completed, will give employment to more than 1000 men.

McArdle & Cooney, 8 East Lombard street, Baltimore, have arranged to erect a 1-story plant, 50 x 100 feet, to be devoted to the manufacture of steam valves, etc.

Bids will be asked for soon by George Nicholson, chief engineer of the port of Seattle commission, for eletric traveling cranes and for the erection of a 2-story warehouse.

S. L. Burgess & Co., Philadelphia, steamship and freight agents, have taken the agency in Philadelphia of the Commercial Baltic line, which operates to Finland ports and Copenhagen.

The Consolidated Steel Corp., New York, will use the port of New Orleans for exporting steel products to South America. A large warehouse has been built, and others are expected to follow.

The government plans to build a marine railway at the Fort Mifflin government reservation. The railway when completed will be 52 feet wide and 192 feet in length.

Work on the construction of 12 piers on the eastern shore of Staten island, is to be started shortly, according to a recent announcement by Dock Commissioner Murray Hulbert.

Among the recent incorporations is that of the Charleston Dry Dock & Machine Co., Mt. Vernon, N. Y. The company is capitalized at $2,225,000 and was incorporated by Harold J. Gallagher, Winthrop H. Kellogg and Robert M. Reid.

The building and repairing of ships will be engaged in by the Robert Redford Co., Ltd., Montreal, Que., which was recently incorporated with $1,000,000 capital. The incorporators are Aubrey H. Elder, Felix W. Hackett, D. Burley-Smith and others.

Capitalized at $10,000, the Butt Welding & Mfg. Co., Detroit, recently was chartered to manufacture machinery and conduct a welding and brazing shop. Charles A. Dunn, Duncan P. Button and F. W. Biederman are the incorporators.

Richard T. Heneker, Henry N. Chauvin, Harold E. Walker and others are the incorporators of the British Wrecking & Salvaging Co., Montreal, Que.,

New Offices

The United Fruit Co. has opened a new office at 220 Montgomery street, San Francisco, to handle freight and passenger service inquiries in connection with the company's established service from New Orleans and New York to Cuba, Jamaica, Central and South America. John H. O'Dowd is in charge of the new office.

The Kerr Steamship Co. has purchased buildings at Nos. 38, 40, 42, 44 and 46 Beaver street, New York, on which site it will erect a 12-story office building. The new building will have a frontage of 99 feet on Beaver street and will run through to South William street with a main entrance at each end. Construction work will be done by the G. A. Fuller Co. and the building is expected to be ready for occupancy about May, 1920. The Kerr company was organized only a few years ago but its growth has been phenomenal as evidenced by its schedule of sailings which covers services to France, Spain, Portugal, Norway, Denmark, Sweden, Holland, Germany, Belgium, Japan, Brazil, Argentine and the Dutch East Indies. According to present plans, the Kerr company will occupy the basement, first, second, third and fourth floors of the new building.

H. M. Hillman, New York, dealer in metals of all kinds for shipbuilding, has opened a branch office in New Orleans. The company specializes in condenser tubes, ferrules, heads, metal valves, bearing metals, bronze, zinc, boiler plating, stern-post plates, etc., and operates branch offices in Philadelphia and Baltimore.

The Judson Freight Forwarding Co. has opened an office in Baltimore with John Corbett in charge as general agent.

Alfred Andersen, New York, dealer in ships' provisions, recently opened a branch store at 214 Chancellor street, Philadelphia. Halfdan Andersen is in charge.

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which was recently chartered to build ships, boats, etc. The company is capitalized at $2,000,000.

A recent Canadian incorporation is that of the Sorel Shipbuilding & Dry Dock Co., Ltd., Sorel, Que. The company is capitalized at $350,000 and was incorporated by J. N. A. Leclaire, Fred Bridges, Alcide Salvail and others.

A recent incorporation is that of the Harbor Boat Repairing Corp., New York. The company, which is capitalized at $5000, was incorporated by C. E. Malmo, J. C. Duke and B. B. Mead, 1999 Washington avenue, New York.

A general boiler and structural business will be engaged in by the Menasha Boiler Works, Menasha, Wis., which was recently incorporated with $50,000 capital, by William J. Hess, William A. Bruce and Arthur Strange.

H. H. Stevens, Vancouver Center, B. C., and S. J. Crowe, Burrard, B. C., have notified the Vancouver board of trade, that if no private company could be found to undertake the building of a drydock in Vancouver, the harbor board would itself take up the proposition.

The Steel Equipment Corp., Avenel, N. J., plans to erect an addition, 2-stories, 80 x 160 feet. It has awarded the contract to the Austin Co., Cleveland. At present it is not in the market for additional equipment, but may be later on. F. A. Danford is purchasing agent.

A contract to design the new $5,000,000 navy yard to be built at Trisconia, Havana harbor, has been awarded to Monks & Johnson, Boston, architects and engineers. This firm planned and supervised the construction of the Victory plant at Squantum, Mass. The Havana harbor yard will be complete, including storehouses, machine shop, foundry, forge shop and derricks.

The Concrete Barge & Ship Co., organized by R. R. Culp and William Hodge, has opened offices in San Francisco. The company proposes to build barges. Construction will be in charge of N. C. Nicolsen, who was superintendent of the San Francisco Shipbuilding Co. when it built the concrete steamer FAITH. The engineering problems of the new company will be handled by Earle Russell, who also comes from the San Francisco Shipbuilding Co. and gained further experience in the construction of the 7500-ton tankers now being built on Government island in the Oakland estuary. The company has a site on the estuary.

New Trade Publications

LOCOMOTIVE CRANES.—A 32-page illustrated catalog has been issued by the Buffalo Hoist & Derrick Co., Buffalo, in which locomotive cranes and parts are described and illustrated. Steel is used in the construction of all vital parts and all spur gears have cut teeth. The booklet contains a number of line drawings.

STEAM POWER PLANTS. — The Murray Iron Works Co., Burlington, Iowa, has issued a catalog describing its power plant equipment. The company has specialized on corliss type engines for many years but during the war it built a number of triple expansion engines for the Emergency Fleet corporation. The catalog is well illustrated and the engines are described in full.

SHIPS.—An interesting booklet recently was issued by the Sun Shipbuilding Co., Chester, Pa., which contains a number of illustrations of the company's products. These show boilers, marine engines and auxiliary machinery. Three reproductions from drawings are also included showing the standard types of ships built by the company. These are accompanied with specifications.

STEERING APPARATUS.—The Benson Electric Co., Superior, Wis., is issuing a catalog describing an electrically controlled steering device. This consists of a controller, located in the wheel house, which transmits current to a 1-horsepower motor that operates the steering engine. It is said that the device is simple in construction and easily operated. The catalog is illustrated and describes the device in detail.

HOISTING MACHINERY. — The Contractors Plant Mfg. Co., Buffalo, has issued a 30-page illustrated catalog, in which hoisting engines and equipment are described and illustrated. These engines are built upon the duplicate part system and thus all parts are interchangeable. Single double and triple-drum hoisting engines and compound geared swinging engines are among those described. Some valuable data are given.

INDICATORS. — The American Steam Gauge & Valve Mfg. Co., Boston, has issued an illustrated catalog of its steam indicators, pantographs, planimeters, indicator cocks, scales, etc. The indicators are fully described and explicit instructions for their use are given. It is pointed out that the indicators are capable of fine adjustments and that they are designed to be productive of accurate results at all engine speeds.

CONDENSERS.—A 190-page illustrated catalog of condensers and auxiliaries has been issued by the C. H. Wheeler Mfg. Co., Philadelphia. Much valuable information is included, together with descriptions of the company's products. The illustrations show complete units while many reproductions from line drawings are included which show typical installations. The part of the catalog devoted exclusively to marine equipment includes descriptions and illustrations of condensers and pumps; saturated steam, barometric pressure and humidity tables.

CUTTING AND WELDING TORCHES.—A catalog describing equipment used in welding and cutting has been issued by the Carbo-Hydrogen Co. of America, Pittsburgh. The catalog is illustrated and contains descriptions of the company's products which include torches, regulators, gages, tanks, complete outfits, etc. Those interested in autogenous welding will find the catalog of practical value as much interesting data relative to welding and cutting is included.

ELECTRIC FIXTURES.—A booklet describing watertight electrical plug receptacles and attaching plugs recently was issued by the Conneaut Metal Works Co., Conneaut, O. The apparatus is fully described and illustrated. It is pointed out that trouble often is caused by damp or wet wiring in a conduit or armored cable wiring system where provision is not made to exclude moisture in places where portable apparatus such as motors, lights, etc., are frequently plugged in and out.

REAMING MACHINE.—Several bulletins describing marine equipment have recently been issued by the Lakeside Bridge & Steel Co., North Milwaukee, Wis. These are bound together in a loose-leaf folder. Among the equipment described is a machine for reaming and countersinking ship and boiler plates. The maximum reaming capacity is 1¼-inch holes while the drilling capacity is 1-inch holes. Another bulletin is devoted to ship gantry cranes. Several illustrations are incuded showing the cranes in actual use in various shipyards.

SIGNAL CONTROL.—An electric flashlight signal and whistle control is described in a 25-page pamphlet recently issued by the Benson Electric Co., Superior, Wis. The device consists of a controlling switch that operates the whistle and a flashlight simultaneously, or each unit independently. It is pointed out that the operating switch can be located in any convenient place and that it is made of brass to resist the action of moisture. The pamphlet contains several illustrations and the device is described in detail.

ELECTRIC HOISTS.—Electric hoists of various types are illustrated and described in a pamphlet recently issued by the Electric Hoist Manufacturers association, New York. The hoists are of two types, floor control hoists, which are controlled by the operator from his position on the floor, and cage controlled hoists which carry a cab for the operator. The hoists are designed on the monorail type. It is pointed out that they can be used to advantage in shipyards for handling raw materials and finished and semifinished units.

HEATING FURNACES.—The W. S. Rockwell Co., New York, has issued an 8-page bulletin describing a new type of small forging and heating furnaces equipped with economizer shields. When these furnaces are in operation the spent gases discharged from the working opening are deflected by the airblast away from the operator and against an economizer through which the air for combustion is circulated. Several illustrations of the various types of these furnaces are shown and reproductions of photographs showing actual installations also are presented.

BUNKER OIL.—Data and descriptive matter relative to bunker and diesel engine oils are given in a booklet recently issued by the Texas Co., New York. Information of value to the engineer and to other users of oil is included. Full specifications of the company's products are given. A table shows the equivalents for fuel oils of various gravities taken at 60 degrees Fahr. An outline map of the United States is included which shows the various tidewater points where the company's products are handled.

PUNCHING AND FORMING PRESSES.—The Ferracute Machine Co., Bridgeton, N. J., recently issued an illustrated, substantially bound, catalog containing over 400 pages. The equipment listed covers practically all types of presses used in sheet metal work. In all, nearly 1000 separate items are listed and described. A short description of each type of machine is given together with a number of illustrations which show the company's presses in actual use in manufacturing plants. The large amount of technical information contained makes the catalog of unusual value.

FUEL OIL.—An attractive, illustrated booklet recently was issued by the Tide Water Oil Co., New York, which contains a number of facts of interest to oil consumers. Fuel oil is described and tables giving the quantity of unmined oil in various parts of the United States are included. An interesting graphic chart shows the apparatus used in refining oil for various purposes. The advantages of using oil as a fuel are described at length and illustrated with charts. The use of oil aboard ship is described and the booklet closes with a description of installation, burner and furnace requirements for oil firing.

CRANES AND HOISTS.—A condensed catalog in which electric traveling cranes, hand power cranes, bridge and gantry cranes, pillar and jib cranes, monorail hoists, etc., are described and illustrated, recently was issued by the Northern Engineering Works, Detroit. Three types of electric hoists are described and illustrated in a 16-page booklet recently put out by the same company. Of these hoists, the first type described is designed for single hook suspension to replace a hand chain hoist or to be attached to an overhead crane. In the second type, the top hook with its hook saddle is omitted. The third type is similar to the second type but has a longer frame and a longer drum, which is grooved to take the wire hoisting rope without overlapping.

SHIP GANTRY.—The Lakeside Bridge & Steel Co., North Milwaukee, Wis., has issued a 4-page folder in which gantry cranes for use in the shipbuilding industry are described and illustrated. In the construction of these cranes special attention has been paid to simplicity in order to facilitate repairs and renewals with a minimum of delay. The trolley truck bearings are of standard specifications with removable bronze bushings and large oil boxes. No overhung gears are used except in the care of the motor pinion. All gears and pinions are machined from solid stock. The hoisting drum is designed to take the full run of rope for a specified lift without overlapping. The trolley is equipped with a special gear shift, operated from the cab, which permits three speeds in hoisting and lowering. The illustrations show a number of actual installations.

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